NetbiterUser Manual

Netbiter® EasyConnect Gateway

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Connecting Devices™

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Important User Information

This document is intended to provide an understanding of the functionality offered by the Netbiter EasyConnect gateways. The document describes the physical design and function of the products, as well as the installation process. For further information regarding the use of the product, please the documentation for Netbiter Argos.

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Netbiter ® is a registered trademark of HMS Industrial Networks AB. All other trademarks are the property of their respective holders. Java is a registered trademark of Oracle and/or its affiliates.

Warning:	This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.
ESD Note:	This product contains ESD (Electrostatic Discharge) sensitive parts that may be damaged if ESD control procedures are not followed. Static control precautions are required when handling the product. Failure to observe this may cause damage to the product.

Netbiter EasyConnect User Manual

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P. About This Document

For more information, documentation etc, please visit the HMS web site www.netbiter.net.

P.1 Related Documents

Document	Author
Netbiter Argos User Manual	HMS
Installation Guides for Netbiter EasyConnect Gateways	HMS

P.2 Document History

Revision List

Revision	Date	Author(s)	Chapter(s)	Description
2.10	January 2014	SDa	Multiple	Removed EC150-M. Removed info on relay in EC150.
2.00	November 2013	SDa	Multiple	Added EC350.
1.1	Mar 2013	SDa	9	New chapter on Ethernet installation.
1.0	Nov 2012	SDa		First official release.

P.3 Conventions & Terminology

The following conventions are used throughout this manual:

- Numbered lists provide sequential steps
- Bulleted lists provide information, not procedural steps

Glossary

Word	Definition
Device	A piece of equipment connected to a Netbiter EasyConnect Gateway.
Field system	A Netbiter EasyConnect Gateway with connected devices.
Device template	A file describing the Modbus parameters for a connected device.
Device profile	Contains a device template (see above), but also provides dashboards, visualizations, logs, alarms, and various gateway settings, to offer a complete interface for the user. See the Netbiter Argos Administration Manual for further details.
Synchronize	Whenever a configuration is added or changed in Netbiter Argos, the changes must be synchronized with the Netbiter EasyConnect Gateway.

P.4 Support

For contact information and support, please refer to the contact and support pages at support.netbiter.com

1. Introduction

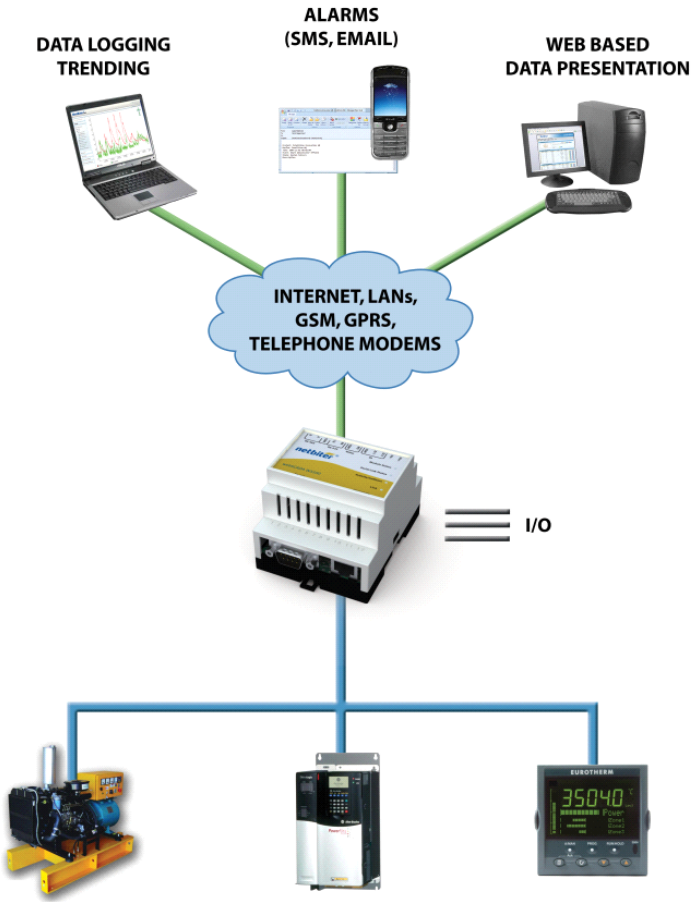
1.1 About Netbiter EasyConnect Gateways

The Netbiter® EasyConnect product family is designed to be plug-and-play, as well as easy to install, configure and maintain. Its plug-n-play structure makes it possible to quickly complete large scale installations without being an IT/mobile network expert. Simplicity is key and this is what the Netbiter® EasyConnect series is about.

Your Netbiter EasyConnect will make it easy to collect data from a remote system and send it to **Netbiter Argos** - a secure data center where all data from your field equipment is securely stored and accessed. Netbiter Argos is hosted by HMS, with redundant servers in several locations. Log on at www.netbiter.net to access management services that enable you to monitor and control your equipment in a fast, efficient and professional way.

Data is stored securely, with backup and database redundancy, and is accessible whenever required. Data can be accessed via the Netbiter Argos web interface, with tools to build presentation pages using dashboard widgets. If you prefer to manage your data yourself, there is a web service API available to access data and save it for further processing.

A Netbiter EasyConnect is a small, robust, communication gateway designed to get your industrial equipment and installations online fast! These gateways are designed for industrial applications and are available with wireless access (2G/3G) or Ethernet communication.



1.2 Product Overviews

1.2.1 Netbiter EasyConnect EC150

Netbiter EasyConnect EC150 is a remote gateway that connects Modbus devices with the Netbiter Argos server over Ethernet. This makes it possible to remotely monitor and control Modbus devices.

Features

- 2 digital inputs (isolated, max 24VDC)
- 10/100 Mbit/s Ethernet interface
- Serial interface RS-232
- Serial interface RS-485, isolated
- DIN rail mounting

1.2.2 Netbiter EasyConnect EC220

Netbiter EasyConnect EC220 reports data from Modbus slave units, digital, analog and temperature signals to Netbiter Argos. The unit has a built-in GPRS modem as its communication channel, so no physical (e.g. Ethernet) Internet connection is required.

Features

- 2 digital inputs (isolated, max 24VDC)
- 1 relay output (max. 24VAC/DC, 1A)
- 2 analog inputs (0-10V, 0-20mA, Pt100)
- 1 analog output (0-10V)
- Quad band GPRS
- Serial interface RS-232
- Serial interface RS-485, isolated
- Wall mount (optional DIN rail mounting)

1.2.3 Netbiter EasyConnect EC250

Netbiter EasyConnect EC250 is a communication gateway that uses an Ethernet connection and a built-in GPRS modem to ensure uninterrupted communication with the Netbiter Argos server. If the Ethernet connection fails, the modem automatically engages, to maintain communication.

Features

- 2 digital inputs (isolated, max 24VDC)
- Quad band GPRS
- 10/100 Mbit/s Ethernet interface
- Serial interface RS-232
- Serial interface RS-422
- Serial interface RS-485
- DIN rail mounting

1.2.4 Netbiter EasyConnect EC350

Netbiter EasyConnect EC350 uses an Ethernet connection and a built-in 2G/3G modem to ensure uninterrupted communication with the Netbiter Argos server. The Ethernet connection and the modem can both be enabled simultaneously, to ensure the best possible communication. The built-in GPS receiver allows for simple positioning of the unit.

Features

- 2 digital inputs, dry contact type
- 4 analog inputs
- 1 relay output
- Serial interface RS-232
- Serial interface RS-485 (isolated)
- 5-band UMTS, Quad band GPRS
- 2 x 10/100 Mbit/s Ethernet interface
- USB interface for local access

2. Mounting

2.1 Netbiter EasyConnect EC220 and EC350

Wall Mounting

These models can be wall mounted directly, by screwing the unit directly to a flat surface using the screw holes provided in the metal casing, as in the example image shown here.

Rail Mounting

These models can also be mounted on a DIN rail, using the optional mounting kit available from HMS Networks AB.

2.2 Netbiter EasyConnect EC150 & EC250

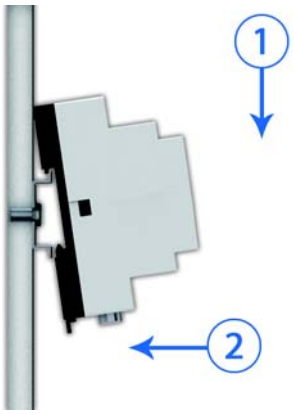
Wall Mounting

This option is not available for these models.

DIN-rail Mounting

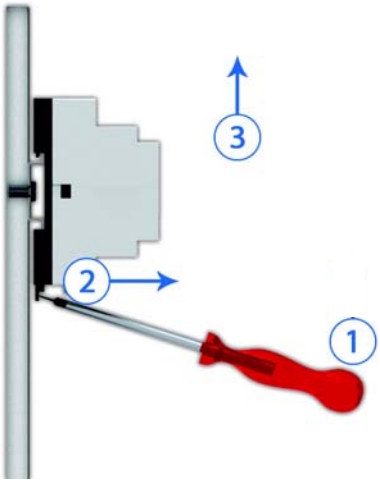
Netbiter EasyConnect EC150 and Netbiter EasyConnect EC250 are supplied ready for mounting on a DIN-rail.

To mount the unit on the DIN-rail:



1. Lower the unit onto the upper lip of the DIN-rail.
2. Press the unit towards the rail. It will snap into place on the lower lip.

To remove the unit from the DIN-rail:



1. Insert a flat-head screwdriver into the slot on the underside of the unit and pull/lever it down.
2. Pull the lower side of the unit free of the rail.
3. Lift the unit free of the rail.

3. Power

Netbiter EasyConnect gateways are powered by the following:

9-24V DC

The power requirements of the various units are as follow:

- Netbiter EasyConnect EC150 = 2 W
- Netbiter EasyConnect EC220 = 2 W
- Netbiter EasyConnect EC250 = 3 W

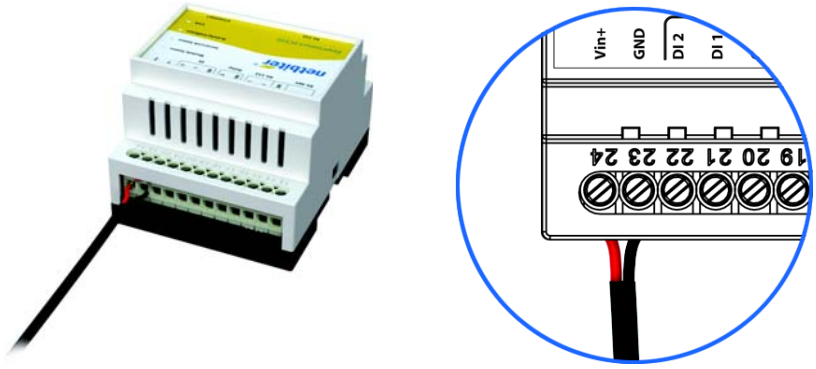
Note that Netbiter EasyConnect EC150 can alternatively be powered by 9-24V AC.

12-48V DC

The power requirements of the Netbiter EasyConnect EC350 vary depending on the types and numbers of functions enabled at any one time. The unit will require an average of 4W, and a maximum of 6W.

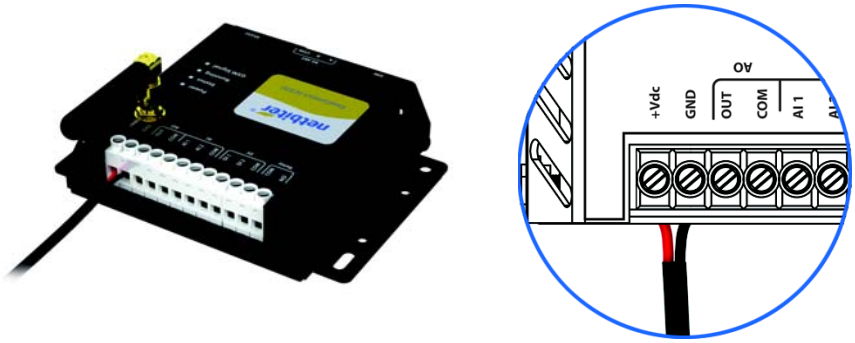
3.1 Netbiter EasyConnect EC150 and EC250

On these models, connect 9-24V DC to pin V+ (or Vin+), and connect the ground wire to GND.



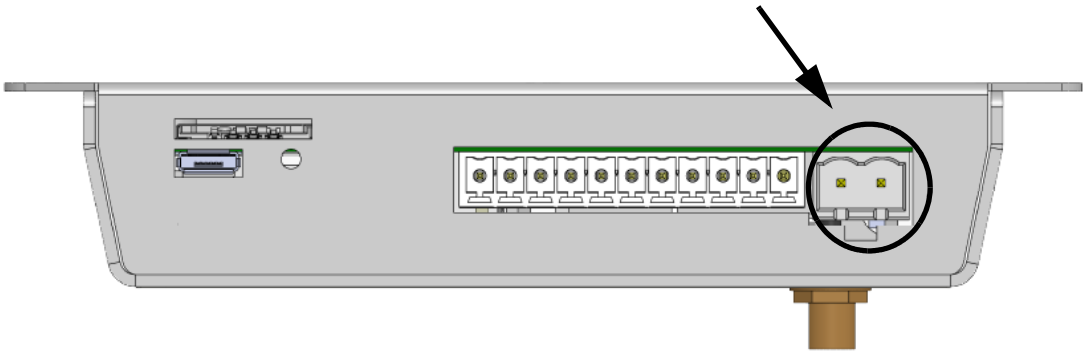
3.2 Netbiter EasyConnect EC220

On this model, connect 9-24V DC to pin +Vdc, and connect the ground wire to GND



3.3 Netbiter EasyConnect EC350

Connect 12-48V DC to the + pin, and connect ground to the - pin.

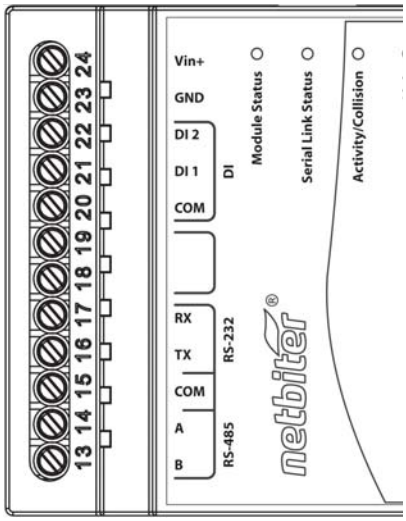


4. Connections

4.1 Netbiter EasyConnect EC150

4.1.1 Terminal Block (12-pin)

Terminal No.	Pin	Function
24	Vin+	Power 9-24VAC/VDC
23	GND	Power ground
22	DI:DI #2	Digital input #2
21	DI:DI #1	Digital input #1
20	DI:COM	Digital input common
17	RS-232 RX	RS-232 Receive
16	RS-232 TX	RS-232 Transmit
15	COM	Common
14	RS-485 A	RS-485 Line A
13	RS-485 B	RS-485 Line B



Digital Inputs (DI)

Netbiter EasyConnect EC150 features 2 digital inputs with the following specifications:

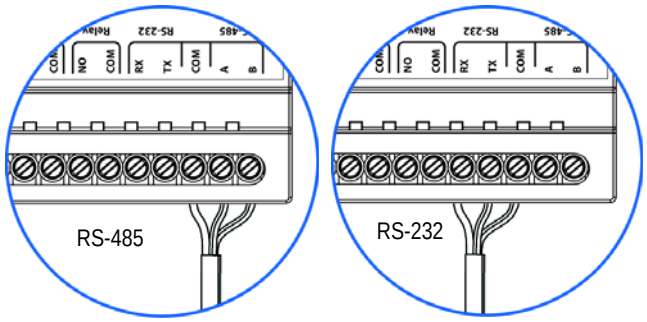
- **Low**: 0-1 VDC
- **High**: 10-24 VDC

RS-485 & R-S232

RS-485 is connected via pins 15-13.

RS-232 is connected via pins 17-15 (or via the D-Sub connector, see 4.1.2)

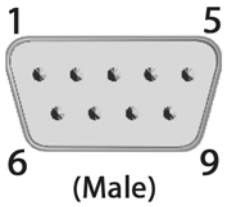
See the illustration for positions.



Note that it is not possible to use both the RS-232 and the RS-485 interfaces simultaneously.

4.1.2 D-Sub Connector

The 9-pin D-Sub connector provides connectivity for Modbus RTU slave units via RS-232. These units are known as “devices” on Netbiter Argos.

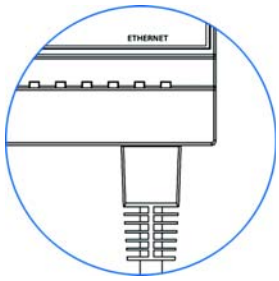


Pin	Other Device
1	CD (Carrier Detect)
2	Rx (Receive)
3	Tx (Transmit)
4	DTR (Data Terminal Ready)
5	GND
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	RI (Ring Indicator)

Note that when using the D-Sub connector it will not be possible to use any protocol simultaneously on the 12-pin terminal block.

4.1.3 Ethernet Connector

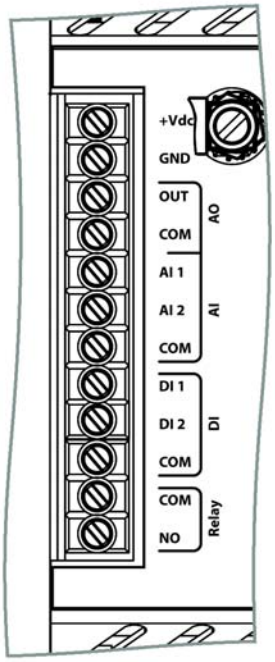
The RJ-45 socket provides the Ethernet network connection for Netbiter EasyConnect EC150. This connector also supports Modbus TCP via Ethernet, which can be used at the same time as Modbus RTU units on another interface.



4.2 Netbiter EasyConnect EC220

4.2.1 Terminal Block (12-pin)

Pin	Function
+Vdc	Power 12-24V DC
GND	Power ground
AO: OUT	Analog output
AO: COM	Analog output common
AI: AI 1	Analog input #1
AI: AI 2	Analog input #2
AI: COM	Analog input common
DI: DI1	Digital input #1
DI: DI2	Digital input #2
DI: COM	Digital input common
Relay: COM	Common
Relay: NO	Normally open connected



GND

The GND terminal (ground) is internally connected to the analog input/output common (AO:COM, AI:COM).

Digital Inputs (DI)

Netbiter EasyConnect EC220 features 2 digital inputs with the following specifications:

- **Low**: 0-1 VDC
- **High**: 9-24 VDC

Relay Output (Digital Output)

There is one relay output with a rated load of 1A at 24V DC.

The relay output must be supplied from an isolating transformer using a secondary listed fuse rated at maximum 3.3A DC and minimum 30V DC.

Analog Inputs (AI)

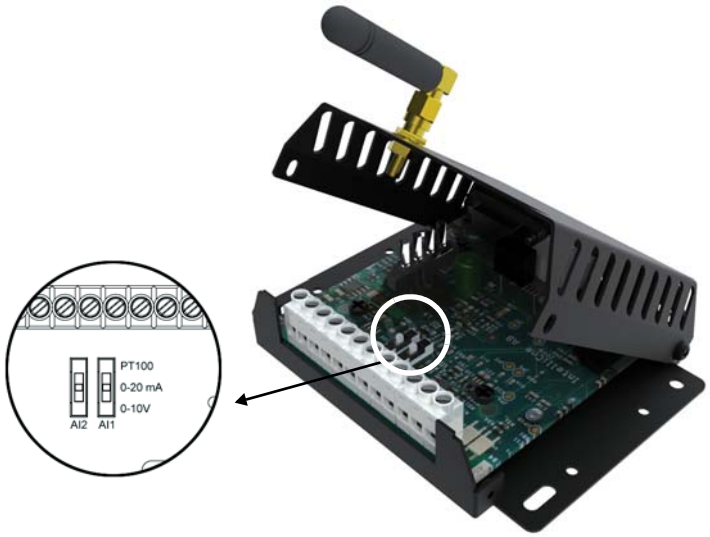
Netbiter EasyConnect EC220 provides 2 analog inputs. Each input can be configured for one of the following functions:

- **PT100**: PT100 temperature sensor (range -50° to +150°C). This is the **default** setting.
- **Current**: 0-20 mA (Input resistance 270 Ohm)
- **Voltage**: 0-10 VDC (Input resistance 280 kOhm)

The function of each analog input is selected by its own switch, which is located inside the unit. To access the switches, remove the cover of the unit by unscrewing the two top screws, using a T10 torx screwdriver. Also loosen the two lower screws, to make it easier to open the cover. Lift the cover carefully and take care not to damage the antenna cable.

Set the switch to match the desired function for the analog input, as shown in the illustration.

When finished, replace the cover, again taking care not to damage the antenna cable. Re-tighten all screws.



Analog Output

Netbiter EasyConnect EC220 has 1 analog output with the following specification:

Voltage: 0-10 VDC

4.2.2 SIM Card Slot

Netbiter SIM Card

When using a Netbiter SIM card (supplied by HMS), the card is configured ready for use, and the PIN code security function has been disabled.

SIM Card - Other Network Operator

To use any another SIM card, you will need to know the following information:

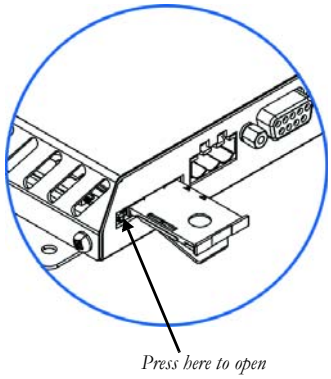
- The phone number for the SIM card.
- The Access Point Name (APN) to connect to, as well as the user name/password - if this is required by the network operator.

The PIN code security function must be also disabled before mounting the SIM card. To do this: insert the SIM card in a regular mobile phone and follow the instructions provided by the manufacturer.

Insert the SIM Card

Open the SIM card holder by pressing the small button at the left of the SIM card slot, with a small screwdriver, pen or similar.

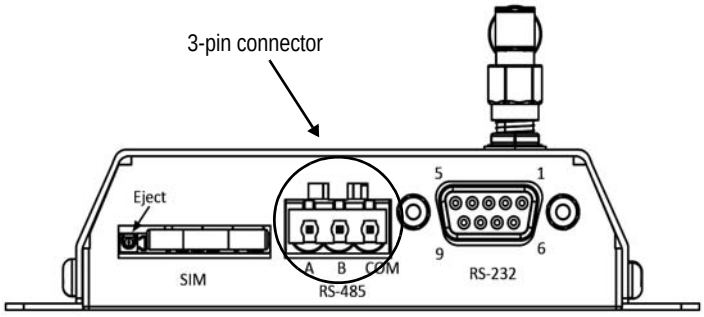
When the SIM card is in place, and the required inputs/outputs have been connected, Netbiter EasyConnect EC220 can be powered up. The rest of the configuration is done via Netbiter Argos. See page 40 for further information.



4.2.3 RS-485 Serial Interface (3-pin Connector)

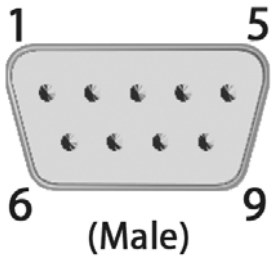
The RS-485 serial interface is used to connect Modbus RTU slave units, known as "devices" in Netbiter Argos.

Pin	Function
A	RS-485 A line
B	RS-485 B line
COM	RS-485 common



Note that when connecting Modbus devices via RS-485 on the 3-pin terminal block, it will not be possible to simultaneously connect Modbus devices via RS-232 on the D-SUB connector.

4.2.4 D-Sub Connector



The male 9-pin D-Sub connector provides an RS-232 interface, which can be used for communicating with Modbus RTU devices, or for attaching a GPS device, to keep track of the position of the remote system.

Pin	Other Device
1	CD (Carrier Detect)
2	Tx (Transmit)
3	Rx (Receive)
4	DTR (Data Terminal Ready)
5	GND
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	RI (Ring Indicator)

Note that when using the D-Sub connector to connect Modbus devices via RS-232, it will not be possible to simultaneously use RS-485 on the 3-pin terminal block. Connecting a GPS device will not affect the simultaneous use of RS-485.

4.2.5 Antenna Connector

The antenna connector is a standard SMA screw connector. Optional external antennas are available from your supplier.

4.3 Netbiter EasyConnect EC250

4.3.1 Terminal Block (12-pin)

Terminal No.	Pin	Function
24	V+	Power 9-24V DC
23	GND	Power ground
22	DI: COM	Digital input common
21	DI: DI1	Digital input #1
20	DI: DI2	Digital input #2
19	RS232: Rx	RS-232 Receive
18	RS232: Tx	RS-232 Transmit
17	COM	Common
16	RS422: RD(A)	RS-485 Receive A
15	RS422: RD(B)	RS-485 Receive B
14	RS485: TD(A) RS422	RS-485 Line A / RS-422 Transmit A
13	RS485: TD(B) RS422	RS-485 Line B / RS-422 Transmit B

Field wiring terminals must be connected with minimum wire size 24AWG.

Digital Inputs (DI)

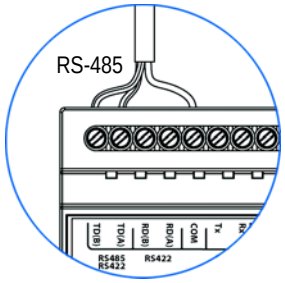
Netbiter EasyConnect EC250 features 2 digital inputs with the following specifications:

- **Low**: 0-1 VDC
- **High**: 10-24 VDC

RS-485 Interface

RS-485 is connected via the following pins:

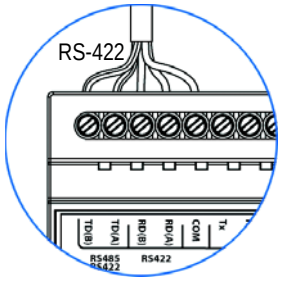
- Pin 13: RS-485 Line B
- Pin 14: RS-485 Line A
- Pin 17: Common



RS-422 Interface

RS-422 is connected via the following pins:

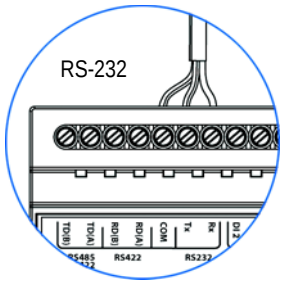
- Pin 13: RS-422 Transmit B
- Pin 14: RS-422 Transmit A
- Pin 15: RS-422 Receive B
- Pin 16: RS-422 Receive A
- Pin 17: Common



RS-232 Interface

RS-232 is connected via the following pins:

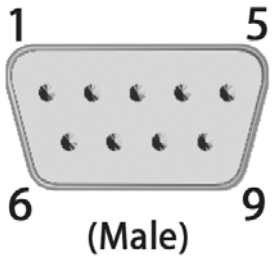
- Pin 17: Common
- Pin 18: RS-232 Transmit (Output)
- Pin 19: RS-232 Receive (Input)



Note that it is not possible to use more than one of these interfaces simultaneously.

Note that when connecting Modbus devices via RS-485, RS-422 or RS-232 on the 12-pin terminal block, it will not be possible to simultaneously connect Modbus devices via RS-232 on the D-SUB connector. It will, however, still be possible to connect a GPS device to the D-SUB connector.

4.3.2 D-Sub Connector



The 9-pin male D-Sub connector provides an RS-232 interface, which can be used for communicating with Modbus RTU devices, or for attaching a GPS device, to keep track of the system's position.

Pin	Function
1	CD (Carrier Detect)
2	Rx (Receive)
3	Tx (Transmit)
4	DTR (Data Terminal Ready)
5	GND
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	RI (Ring Indicator)

Note that when using the D-SUB connector to connect Modbus devices via RS-232, it will not be possible to connect any Modbus devices simultaneously on the 12-pin terminal block. This does not apply when connecting a GPS device to the D-SUB connector.

4.3.3 Ethernet Connector

The RJ-45 socket provides the Ethernet network connection for Netbiter EasyConnect EC250. This connector also supports Modbus TCP via Ethernet, which can be used at the same time as Modbus RTU units on another interface.

4.3.4 SIM Card Slot

Netbiter SIM Card

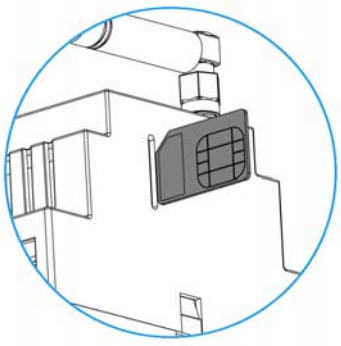
When using a Netbiter SIM card (supplied by HMS), the card is configured ready for use, and the PIN code security function has been disabled.

Other SIM Cards

To use any other SIM card, you will need to know the following information:

- The phone number for the SIM card.
- The Access Point Name (APN) to connect to, as well as the user name/password, if this is required by the network operator.

The PIN code security function must be also disabled before mounting the SIM card. To do this: insert the SIM card in a regular mobile phone and follow the instructions provided by the manufacturer.



Insert The SIM card

The SIM card shoud be pushed into the slot provided on the side of the unit, as shown here. The side of the SIM card with the gold plating should face towards the 12-pin terminal block, and the end with the cut corner should be inserted first. When the card is fully inserted it will lock into position.

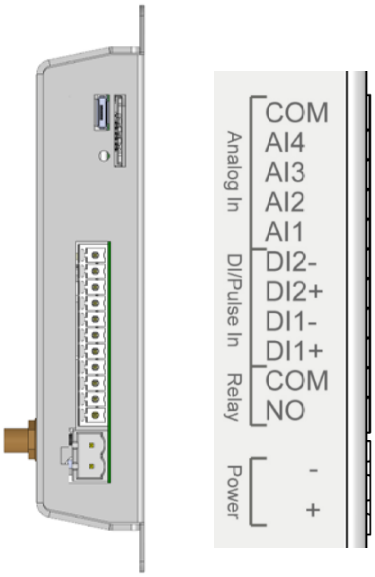
When the SIM card is in place, and the required inputs/outputs have been connected, Netbiter EasyConnect EC250 can be powered up. The rest of the configuration is done via Netbiter Argos. See page 40 for further information.

To extract the SIM card, simply press again to release.

4.3.5 Antenna Connector

The antenna connector is a standard female SMA screw connector. Optional external antennas are available from your supplier.

4.4 Netbiter EasyConnect EC350



4.4.1 Terminal Block (11-pin)

No.	Label	Function
11	(Analog In) COM	Analog ground
10	(Analog In) AI4	Analog Input #4
9	(Analog In) AI3	Analog Input #3
8	(Analog In) AI2	Analog Input #2
7	(Analog In) AI1	Analog input #1
6	(DI/pulse In) DI2-	Digital input 2
5	(DI/pulse In) DI2+	Digital input 2 current source
4	(DI/pulse In) DI1-	Digital input 1
3	(DI/pulse In) DI1+	Digital input 1 current source
2	(Relay) COM	Relay Output, COM, Isolated
1	(Relay) NO	Relay output, NO, isolated

Digital Inputs (DI)

Netbiter EasyConnect EC350 features 2 digital inputs of the dry contact type, i.e. they do not require any control voltage, and will function with a switch or breaker. Please observe the following for the digital inputs:

- Max recommended cable length = 3m. It may be possible to use the inputs with longer cable lengths, but this may give rise to problems.
- ⚠ Do not apply a power source to the digital input, as there is a risk it will burn out.

Relay Output (Digital Output)

There is one relay output with a rated load of 1A at 24V DC.

The relay output must be supplied from an isolating transformer using a secondary listed fuse rated at maximum 3.3A and minimum 30V DC.

Analog Inputs (AI)

Netbiter EasyConnect EC350 provides 4 analog inputs. All 4 inputs support:

- **Current**: 0-20 mA (Input resistance 270 Ohm)
- **Voltage**: 0-10 VDC (Input resistance 280 kOhm)

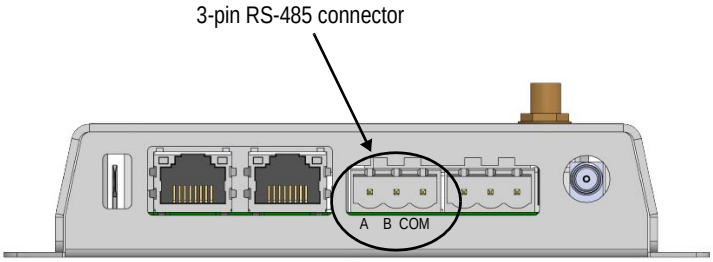
Analog inputs 1 and 3 also support the connection of:

- **PT100**: PT100 temperature sensor (range -50° to +150°C).

4.4.2 RS-485 Serial Interface (3-pin Connector)

The RS-485 serial interface is used to connect Modbus slave units, known as "devices" in Netbiter Argos.

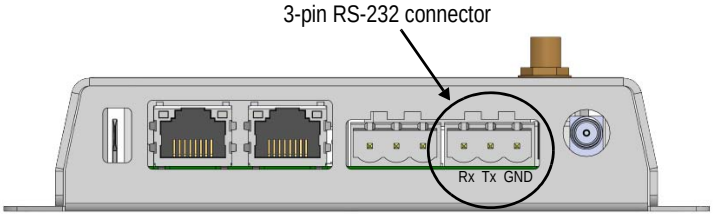
Pin	Function
A	RS-485 Line A
B	RS-485 Line B
COM	ISO GND (isolated ground



4.4.3 RS-232 Serial Interface (3-pin Connector)

The RS-232 serial interface is used to connect a single Modbus slave unit.

Pin	Function
Rx	Rx Receive input
Tx	Tx Transmit output
GND	Signal ground

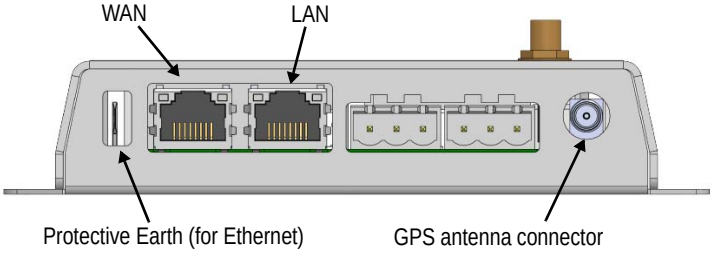


4.4.4 Ethernet Connectors

Two RJ-45 sockets are included:

- WAN: This socket is for the WAN Ethernet network connection, i.e. for connecting to the Internet and Netbiter Argos.
- LAN: This second network interface is intended for use with future features, and is disabled by default.

Each Ethernet socket provides a link activity indicator, located at the top left of the socket.

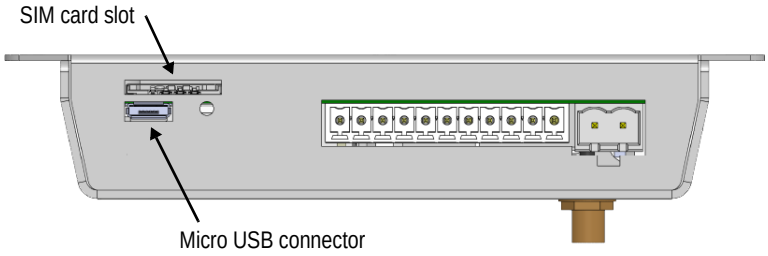


4.4.5 GPS Antenna Connector

The Netbiter EasyConnect EC350 includes a built-in GPS receiver. An external GPS antenna should be connected to the female SMA screw connector on the underside of the unit. This socket also provides power for active GPS antennas.

4.4.6 Micro USB Connector

This connection can be used to connect the Netbiter EasyConnect EC350 to a PC, to upgrade the firmware, or to troubleshoot problems. For further information, see section 10.4.



4.4.7 SIM Card Slot

Netbiter SIM Card

When using a Netbiter SIM card (supplied by HMS), the card is configured and ready for use, and the PIN code security function has been disabled.

Other SIM Cards

To use any other SIM card, the following information is required:

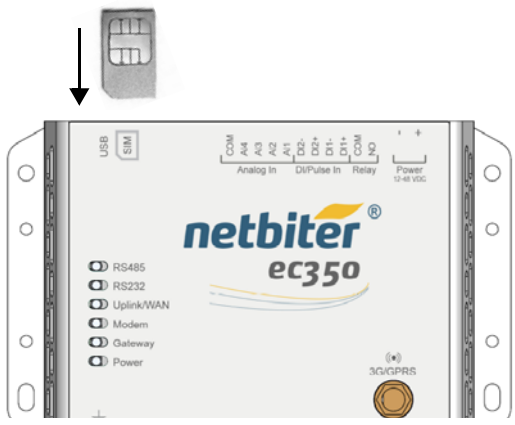
- The phone number for the SIM card.
- The Access Point Name (APN) to connect to, as well as the user name/password, if required by the network operator.

Important! - There is no support in the Netbiter EasyConnect EC350 for using a PIN code on the SIM card. For a SIM card with an active PIN code, the code must first be deactivated by inserting the card into a mobile/cell phone and performing the operation there. The PIN code **cannot** be deactivated in the Netbiter EasyConnect EC350.

Insert The SIM card

The SIM card shoud be pushed into the slot provided on the top side of the unit. The side of the SIM card with the gold plating should face upwards, and the end with the cut corner should be inserted first. When the card is fully inserted it will lock into position.

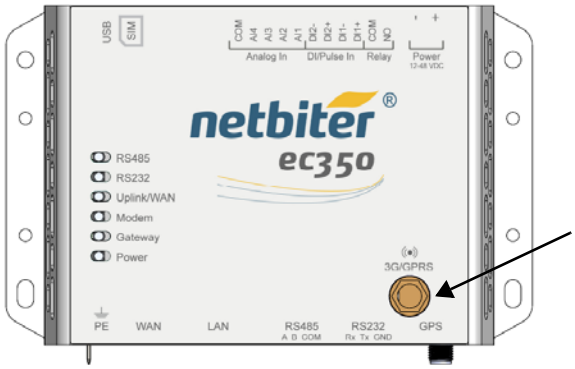
To extract the SIM card, simply press again to release.



Inserting/changing the SIM card will cause the information from the SIM card to be transmitted to Netbiter Argos.

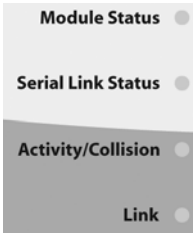
4.4.8 2G/3GAntenna Connector

The antenna connector on the top of the unit is a standard female SMA screw connector, and is intended for use with the 2G/3G connection. A stub antenna is supplied as standard, and optional external antennas are available from your supplier.



5. LED Indicators

5.1 Netbiter EasyConnect EC150



LED	Indicates
Module Status	Basic unit status and errors
Serial Link Status	Receiving or transmitting serial signal
Activity/Collision	The activity on the Ethernet link
Link	The speed of the Ethernet link

5.1.1 Module Status LED

The Module Status LED indicates the status of the unit and whether there are any problems. Once the unit is fully operational it will show 3 green flashes, as below. During the boot-up phase, the LED will first show orange and then steady green. It will take approximately 30 seconds for the unit to start completely.

Unlit/OFF: No Power

Check the power supply.

3 Green Flashes: Running

After the bootup phase is complete, this indicates normal operation.

2 Red Flashes: Problem with Network Settings.

Ensure that the network settings are correct:.

- If set to DHCP, check that there is a DHCP server on the network.
- If set to use a static IP address, check the settings for the IP address, default gateway and DNS server.
- If a proxy is used, make sure that settings are correct.

3 Red Flashes: No Connection to Netbiter Argos.

Ensure that one of the Ethernet ports 443, 80 or 5222 is open in the firewall, and if a proxy is used, that the proxy settings are correct.

5.1.2 Serial Status LED

Flashing green: Receiving serial packet

Flashing red: Transmitting serial packet

5.1.3 Activity/Collision LED

Flashing green:	Receiving Ethernet packet
Flashing red:	Ethernet Collision detected

5.1.4 Ethernet Link LED

Steady green:	10 Mbps Ethernet network detected
Steady orange:	100 Mbps Ethernet network detected

5.2 Netbiter EasyConnect EC220

LED	Indicates
Power	Power to unit
Status	Connection to Netbiter Argos
Running	Normal operation
GSM signal	Signal strength

5.2.1 Power LED

Steady green on the Power LED indicates that Netbiter EasyConnect EC220 is powered up and running.

5.2.2 Status LED

The Status LED indicates the following conditions, in 4-second cycles.

Unlit (No Flashes): Normal Operation

1 Red Flash: Not Registered on Home Network.

The Netbiter SIM card will automatically connect to a network that is part of the worldwide network of tele-operators in the HMS "home network". For a list of worldwide partners, please see the support pages for Netbiter Argos at http://support.netbiter.com

If there is good signal strength, but the unit still shows "not registered on home network", then there may be another network operator with better GPRS signal strength in this location. Check also that the antenna is mounted and that the SIM card is inserted correctly. Ensure that the mobile network has coverage at the location where you are using the device. An external antenna can be used to improve reception.

2 Red Flashes: Problem with Network Settings.

Check that the Access Point Name (APN) is set for the SIM card being used. When entering the APN, it is recommended that is done from Netbiter Argos (for Netbiter EasyConnect EC220, this is the only option). Otherwise the APN might only be stored locally in the unit, which can cause problems when

replacing a faulty unit. With the APN stored at Netbiter Argos, the replacement functionality automatically sends all the necessary settings to the unit.

3 Red Flashes: No Connection to Netbiter Argos.

EC220 will attempt to connect to the Netbiter Argos server. If it cannot, check that the mobile network operator grants access to the network port 5222.

5.2.3 Running LED

This LED will flash green to indicate normal operation.

5.2.4 GSM Signal LED

1 Green Flash: Low Signal.

The signal strength is too weak. Make sure the antenna is correctly mounted and pointing upwards. Use another external antenna, or try relocating the antenna using extension cables.

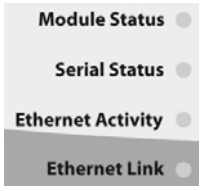
2 Green Flashes: Medium Signal Strength.

The unit will function, but a stronger signal is recommended. Try experimenting with antenna placement to improve reception.

3 Green Flashes: Good Signal.

This indicates an optimal setup.

5.3 Netbiter EasyConnect EC250



LED	Indicates
Module status	System status and signal
Serial Status	Serial communication traffic
Ethernet Activity	Network traffic
Ethernet Link	Network speed

5.3.1 Module Status LED

During the boot-up phase, the Module Status LED will first show red and then steady green. It will take approximately 40 seconds for the unit to start completely.

Thereafter, the Module Status LED is used for indicating two types of message:

- **System** messages for the connection to Netbiter Argos, indicated by red flashes.
- **Signal strength** for the GPRS signal, indicated by green flashes.

These indications are shown in 4-second cyclic loops, which alternate between:

- 2 seconds of red flashes indicating system messages
- 2 seconds of green flashes indicating the strength of the GPRS signal.

The Module Status LED can indicate the following:

Unlit/OFF: No Power

Check the power supply.

SYSTEM MESSAGES

Unlit: Normal Operation

When the unit is running correctly, the unit will not show any red indications, consequently the LED will only be flashing green, to indicate the signal strength.

1 Red Flash: Not Registered on Home Network.

The HMS SIM card will automatically connect to a network that is part of the worldwide network of tele-operators in the HMS "home network". For a list of worldwide partners, please see the support pages for Netbiter Argos at http://support.netbiter.com

If there is good signal strength, but the unit still shows "not registered on home network", then there may be another network operator with better GPRS signal strength in this location. Check also that the antenna is mounted and that the SIM card is inserted correctly. Ensure that the mobile network has coverage at the location where you are using the device. An external antenna can be used to improve reception.

2 Red Flashes: Problem with Network Settings.

- For **GPRS**: Check that the Access Point Name, APN, is set for the SIM card being used. When entering the APN it is recommended that this is done from Netbiter Argos. Otherwise the APN might only be stored locally in the Netbiter, which can cause trouble when replacing a faulty gateway. With the APN stored at Netbiter Argos, the replacement functionality automatically sends all necessary settings to the unit.
- For **Ethernet**: When using Ethernet as the primary channel make sure that the network settings are correct:
  - If set to DHCP, make sure that there is a DHCP server on the network for the EC250.
  - If set to use a static IP address, make sure that the IP address, default gateway and DNS are all correct.
  - If a proxy is used, make sure that settings are correct.

3 Red Flashes: No Connection to Netbiter Argos.

For **GPRS**: Make sure that the APN is correct.

For **Ethernet**: Make sure that one of the Ethernet ports 443, 80 or 5222 is open in the firewall, and if a proxy is used, that the settings for it are correct.

SIGNAL STRENGTH

1 Green Flash: Weak Signal.

The signal strength is too weak. Make sure the antenna is correctly mounted and pointing upwards. Use another external antenna, or try relocating the antenna using extension cables.

2 Green Flashes: Medium Signal Strength.

The unit will function, but a stronger signal is recommended. Try experimenting with antenna placement to improve reception.

3 Green Flashes: Good Signal.

This indicates an optimal setup.

5.3.2 Serial Status LED

The Serial Status LED indicates ongoing serial communication through the serial ports. This includes data traffic for RS-232, RS-422, RS-485, and GPRS traffic (modem).

Red flash: Transmitting serial packet.

Green flash: Receiving serial packet.

Orange: During boot up.

5.3.3 Ethernet Activity/Collision LED

The Ethernet Activity LED indicates network traffic.

Green flash: Receiving Ethernet packet.

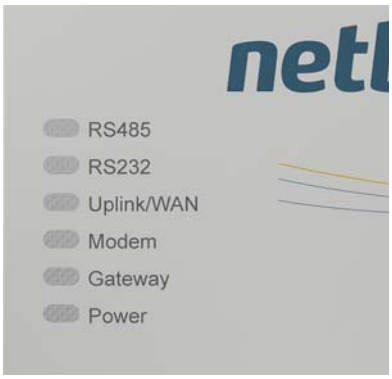
5.3.4 Ethernet Link LED

Off: No Ethernet link detected.

Steady green: 10 Mbps Ethernet network detected.

Steady orange: 100 Mbps Ethernet network detected.

5.4 Netbiter EasyConnect EC350



LED	Indicates
RS485	Status for RS-485 port
RS232	Status for RS-232 port
Uplink/WAN	Connection status via WAN port
Modem	Modem status, including signal strength
Gateway	System status
Power	Indicates when unit has power
Ethernet Link (on RJ45 socket)	Network speed

Note that while the unit is booting up, all the LED:s except the Power LED will show orange.

5.4.1 RS485 / RS232 LED

These two LED:s indicate the status of the serial ports, according to the following:

OFF: Port not in use

Steady red: Port not available

Contact HMS support.

Steady green: Port is configured for use.

5.4.2 Uplink/WAN LED

This LED indicates the status of the connection to Netbiter Argos/Internet.

Steady green: Connected to Netbiter Argos

One orange flash: No IP address

- For dynamic IP address - check for DHCP server on network.
- For fixed IP address - check the set IP address.

Two orange flashes: No connection to Argos/Internet

Check all network settings (gateway, DNS servers, netmasks, etc) and firewalls.

5.4.3 Modem LED

OFF: Modem not active.

Steady red: Modem not available.

Contact support.

One orange flash: SIM card missing

Check that the SIM card is properly inserted.

The HMS SIM card will automatically connect to a network that is part of the worldwide network of tele-operators in the HMS "home network". For a list of worldwide partners, see the support pages for Netbiter Argos at http://support.netbiter.com.

Two orange flashes: PIN code active for SIM card

Deactivate the PIN code.

Three orange flashes: No APN server specified

Check that the Access Point Name, APN, is set for the SIM card being used. When entering the APN it is recommended that this is done from Netbiter Argos. Otherwise the APN might only be stored locally in the Netbiter, which can cause trouble when replacing a faulty gateway. With the APN stored at Netbiter Argos, the replacement function automatically sends all necessary settings to the unit.

Steady green: Optimum 2G/3G signal

Steady green with breaks: Less than optimum 2G/3G signal

Replace stub antenna with 5m extension antenna. Reposition for better reception. The more the LED shows green, the better the signal.

5.4.4 Gateway LED

Unlit: No power, or unit is still starting up

Regular green flash: Normal operation

5.4.5 Power LED

Unlit: No power

Steady green: Unit has power

5.4.6 Ethernet Link LED (on RJ-45 port)

The Ethernet Link LEDs indicate network traffic and its speed.

Off: No Ethernet link detected.

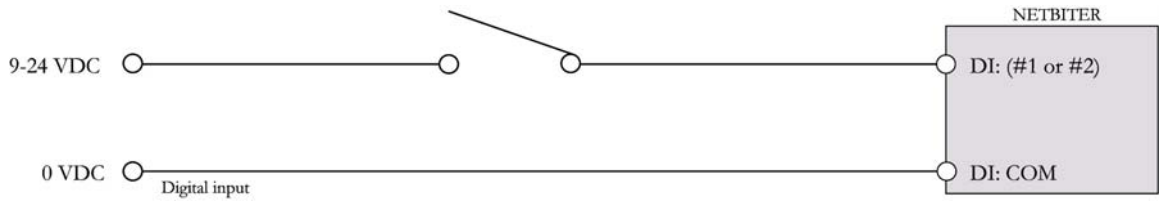
Orange flashes: Activity on a 10 Mbps Ethernet network.

Green flashes: Activity on a 100 Mbps Ethernet network.

6. I/O Wiring Diagrams

6.1 Netbiter EasyConnect EC150

6.1.1 Wire a Device on a Digital Input

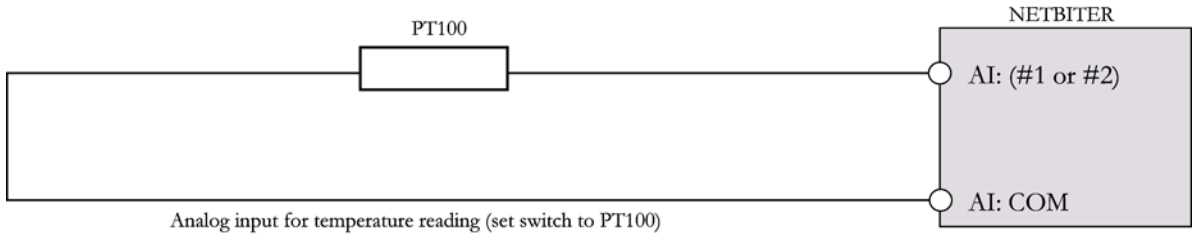


6.2 Netbiter EasyConnect EC220

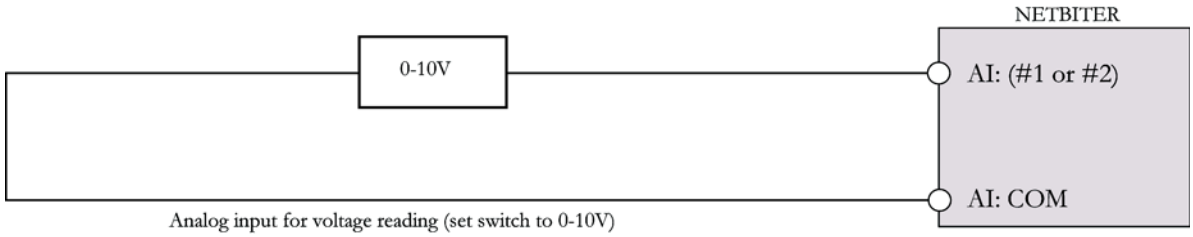
6.2.1 Input Wiring

Please see page 17 for how to set the Analog input switch.

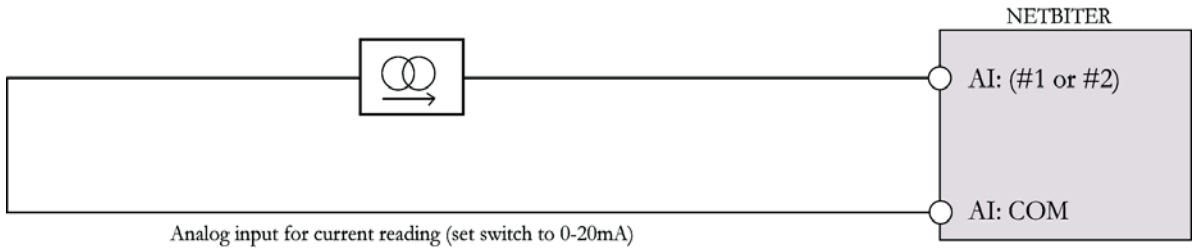
Wire an Analog Input for Temperature Readings



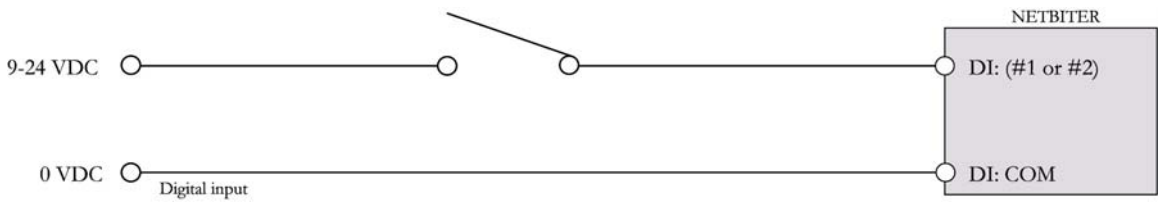
Wire an Analog Input for Voltage Readings



Wire an Analog Input for Current Readings

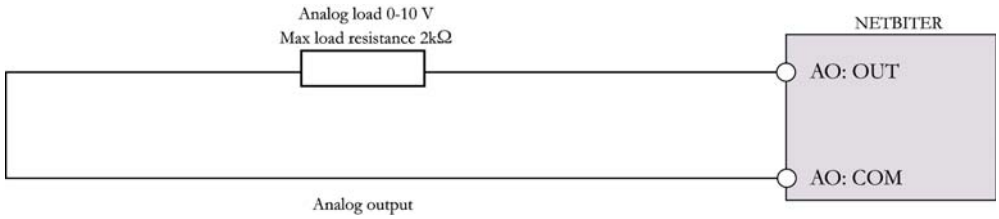


Connect a Device to a Digital Input

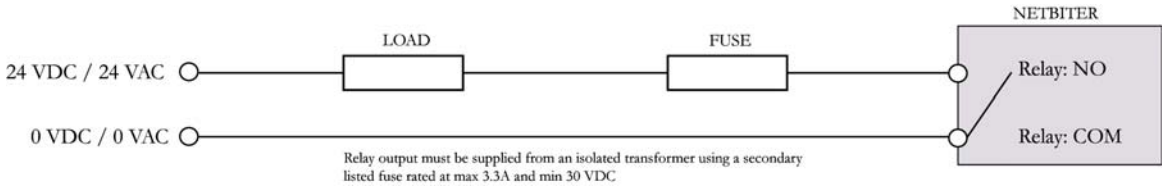


6.2.2 Output Wiring

Wire the Analog Output



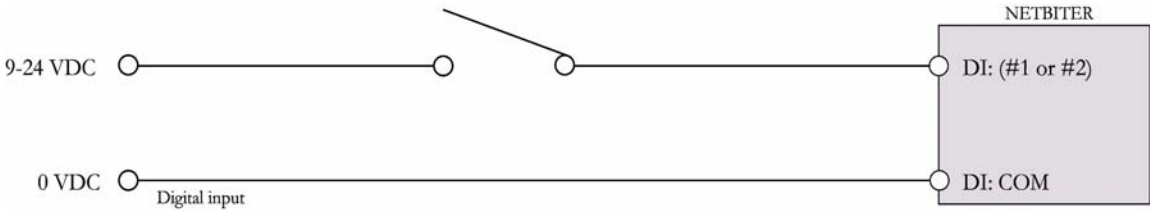
Wire a Relay to the Relay Output



6.3 Netbiter EasyConnect EC250

6.3.1 Input Wiring

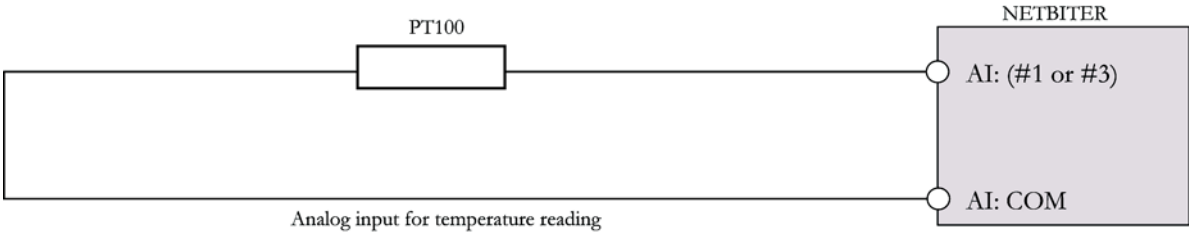
Connect a Device to the Digital Input



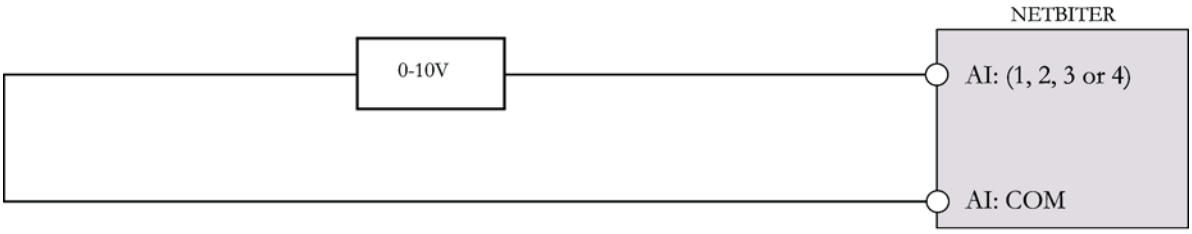
6.4 Netbiter EasyConnect EC350

6.4.1 Input Wiring

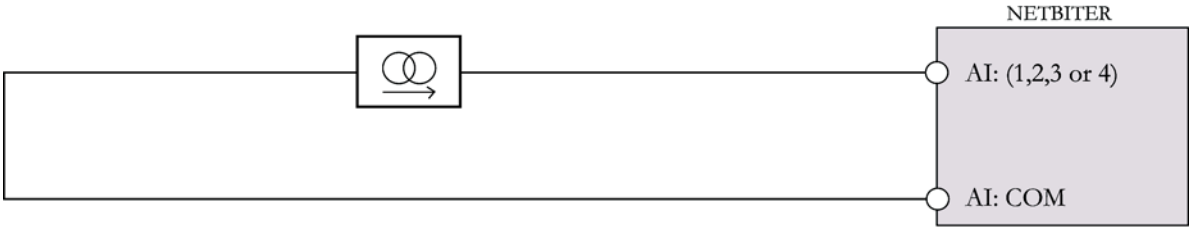
Wire an Analog Input for Temperature Readings



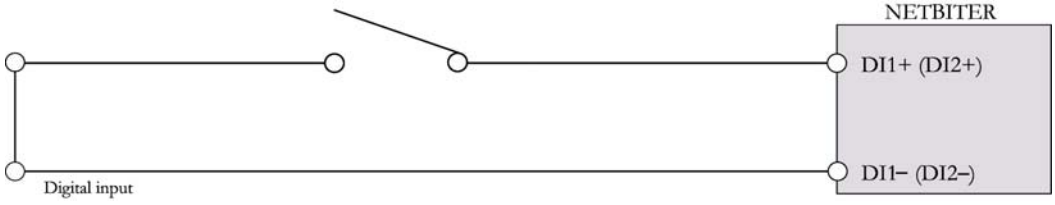
Wire an Analog Input for Voltage Readings



Wire an Analog Input for Current Readings

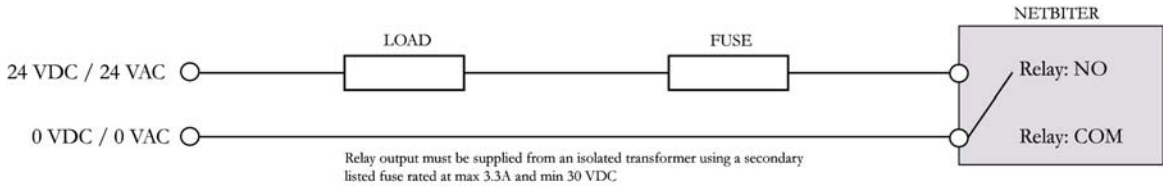


Connecting a Device to a Digital Input



6.4.2 Output Wiring

Connecting a Relay to the Relay Output



7. GPS

Most Netbiter models provide support for GPS location functions, which can be used to report the unit's location, and also to send alarms if the system moves out of a pre-defined area.

Some Netbiter Gateways require the use of a separate GPS receiver, which is connected via RS-232 on the 9-pin D-Sub interface. The receiver must support NMEA version 3 protocol, with sub-messages GGA and RMC.

Other Netbiter models feature a built-in GPS receiver, and thus only require the connection of an antenna.

7.1 GPS Devices

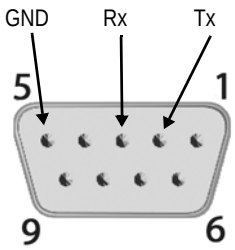
See below for details on how to connect and use GPS with each Netbiter model.

For information on how to power an external GPS unit, see the documentation supplied with the device.

7.1.1 Netbiter EasyConnect EC220

Connecting the GPS device to the D-Sub interface requires a 9-pin male D-Sub connector with the following configuration:

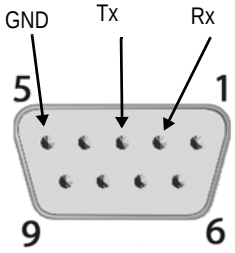
- Pin 2: Transmit (Tx) from GPS
- Pin 3: Receive (Rx) from GPS
- Pin 5: Ground



7.1.2 Netbiter EasyConnect EC250

This model requires a 9-pin female D-Sub connector, with the following wiring configuration:

- Pin 2: Receive (Rx) from GPS
- Pin 3: Transmit (Tx) from GPS
- Pin 5: Ground



7.1.3 Netbiter EasyConnect EC350

This model features a built-in GPS receiver. All that is required is to connect a GPS antenna to the socket on the unit.

7.2 Activate the GPS function

Before it is possible to use a GPS device (external or internal), the GPS functionality must first be activated at Netbiter Argos. Information on how to do this can be found in the online guide "Add GPS", which is available by logging into Netbiter Argos, and then clicking on the wand in the upper right corner.

7.3 Further Information

HMS Industrial Networks supplies various accessories for use with Netbiter Communication Gateways

- The *Netbiter Argos GPS Tool Kit* (Order Code: E-019). See www.netbiter.com for more information. This product is compatible with both Netbiter EasyConnect EC220 and Netbiter EasyConnect EC250.
- GPS antenna. This product is compatible with Netbiter EasyConnect EC350.

8. Adding a Netbiter EasyConnect

Before you can use your Netbiter EasyConnect gateway it must be registered and activated. This is done from a user account at Netbiter Argos. Activating the unit will enable access to Netbiter Argos.

- If you do not yet have an account at Netbiter Argos, see section 8.2.
- To active the Netbiter EasyConnect gateway from an existing Netbiter account, see section 8.3.

8.1 About Netbiter Argos

Netbiter Argos is the main method used for activating, configuring and managing your Netbiter Easy-Connect gateways. The service consists of a web-based communications centre for all your connected gateways, and is accessible from any Internet connected browser. The service provides access to control functions, logs and stored data.

A **field system** is the term as applied in Netbiter Argos to a single Netbiter EasyConnect gateway and all of its connected devices.

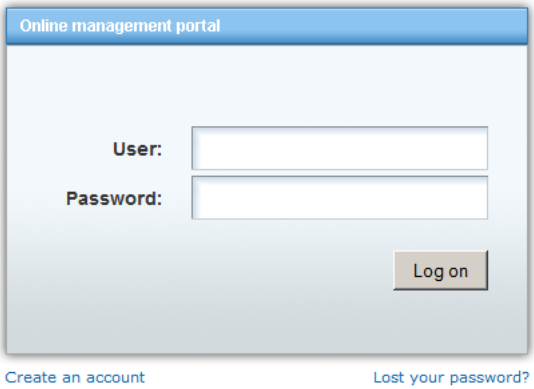
A **project** contains any number of Netbiter Argos field systems. A project can be used to group multiple field systems according to location, to client, access level or any other suitable grouping.

8.2 Add a System to a New Netbiter Argos account

8.2.1 Create the Netbiter Argos account

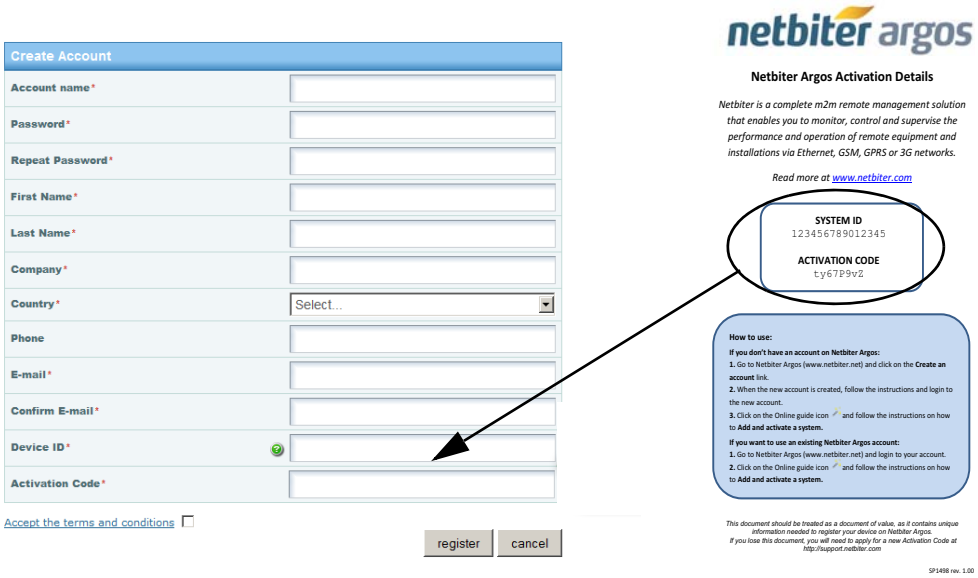
Follow these steps if you do not yet have a Netbiter Argos account and are adding your first Netbiter EasyConnect.

1. In your browser, go to www.netbiter.net and click on **Create an account**.

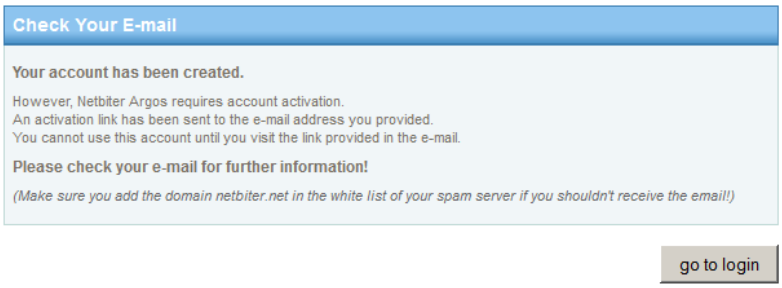


2. Enter the required information, including the product's unique **System ID** and **Activation code**.

Important! - The product's System ID and Activation Code are provided on a printed sheet in the package for your Netbiter EasyConnect gateway. This is a valuable document that should be saved - please store **safely**!



3. Check the box for "*Accept the terms and conditions*" and then click the **Register** button, after which you will see the following message:

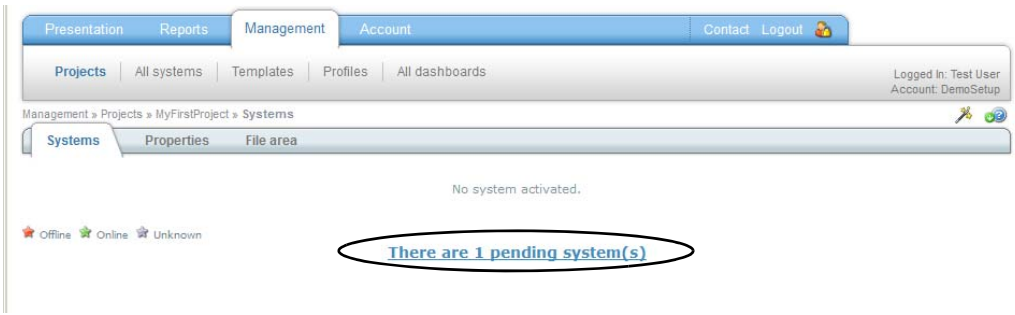


Open the email sent to you by the Netbiter Argos server and follow the instructions there on how to activate your account.

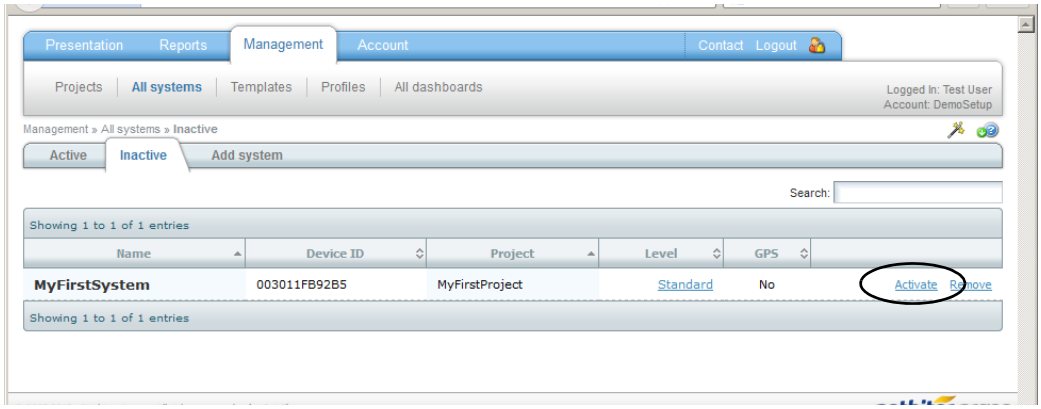
8.2.2 Activate the Netbiter EasyConnect

1. For a new account, log in to it and click on the project called **My first project** and click on the link to There are 1 pending system(s).

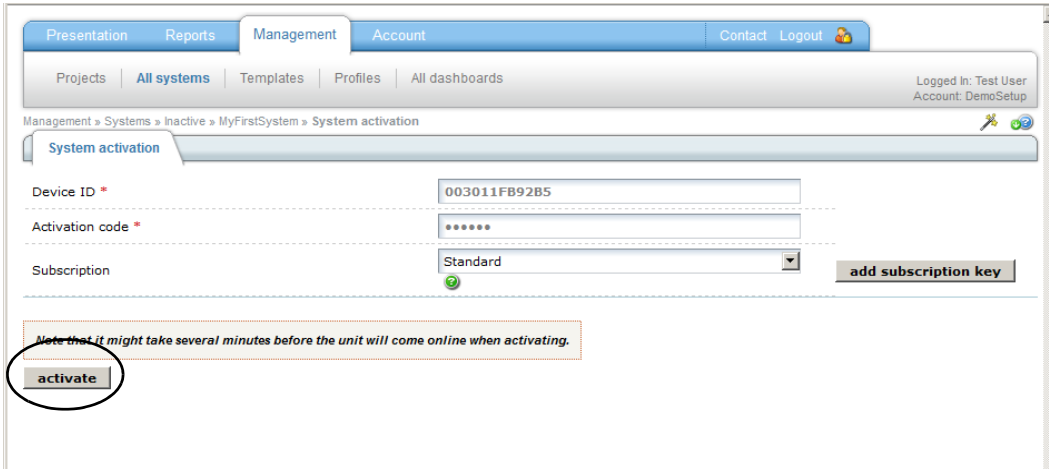
If adding the unit to an existing account, find the unit in the list of **Inactive Systems**.



2. Click the link **Activate**, to use the unit it in this project and account.



3. In the subscription field, select *Standard*, and then click the **Activate** button.



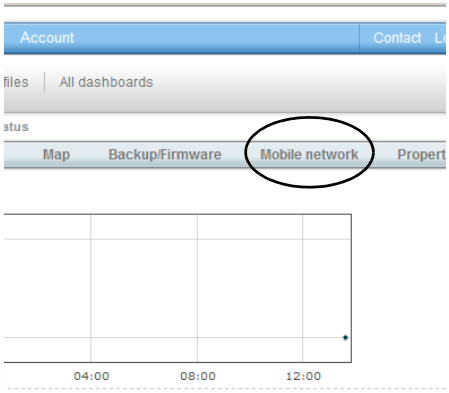
A message will now be sent to the Netbiter EasyConnect, and the configuration will be processed. The unit will reboot and automatically connect to the Netbiter Argos Server. There may be a delay before the unit is visible online at Netbiter Argos.

Next Steps - Ethernet Connection

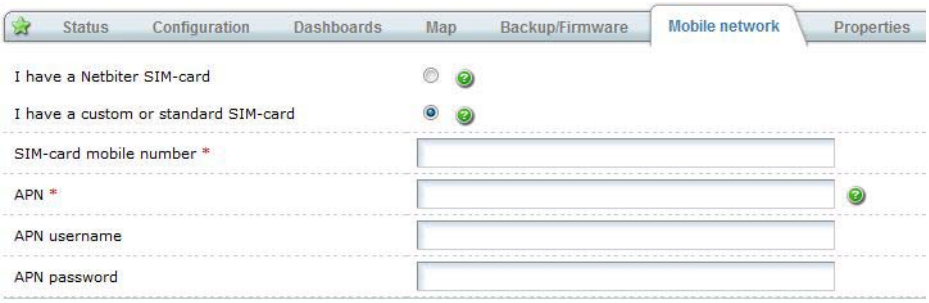
If the unit is using an Ethernet connection the activation process is now complete. To continue setting up the unit, please see "Further Configuration" on page 44. To activate the unit via a wireless connection, see below.

Next Steps - GPRS/Wireless Connection

1. From the status page that is now displayed, click on the link to **Mobile Network**.



The following page is displayed:



2. Now select the type of SIM card to use:

- If using a **Netbiter SIM card** (provided by HMS Industrial Networks), select the radio button for this and enter the phone number for the SIM card. This number can be found in the envelope for the SIM card.
- To use a **custom or standard SIM card** from another operator, you need to enter:
  - the phone number to the SIM card
  - the APN (Access Point Name) and the user name and password, if required by the network.

  All of the above information should be supplied together with the SIM card. If not, please contact the network operator to obtain this information.

3. Check that the unit has power and satisfactory signal strength, and then click **Send**. The Netbiter Argos will now communicate with the remote gateway, upon which it will reboot and then connect to the Netbiter Argos server. This process may take some time to complete. When the gateway is online, this will be reported in the status page.

IMPORTANT - Using a PIN code for the SIM card is not recommended, and when using Netbiter EasyConnect EC220 or Netbiter EasyConnect EC350 it is not even possible to use a PIN code. A Netbiter SIM card already has the the PIN code function disabled. To disable this on any other SIM card - first insert it into a mobile phone and perform the operation there.

8.3 Add a System to an Existing Netbiter Argos Account

To add the gateway to an existing Netbiter Argos account:

1. Go to Netbiter Argos (www.netbiter.net) and log in to the account.
2. Click the menu option **Management >> All systems >> Add system**

3. Enter the required information, including the System ID and Activation code, as supplied with the product. See page 43 for instructions concerning wireless models.
4. Click the **Add** button. The unit will now appear in the list of **Inactive systems**.
5. **Activate** the unit, as described on page 42.

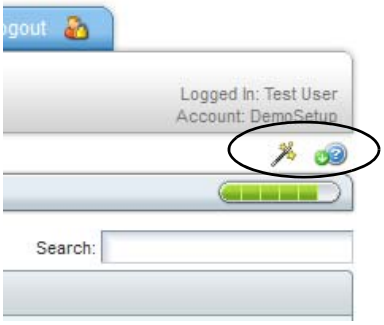
8.4 Further Configuration

Further configuration of the Netbiter EasyConnect makes it possible to view and change settings, send alarms, log events, store data, etc. For more information on procedures and settings, the following are available:

The online guide at Netbiter Argos. Click the magic wand icon in the upper right corner of the Netbiter Argos window.

Extended help, also at Netbiter Argos. Click the blue question mark icon next to the online guide icon.

The Netbiter Argos Administration Manual, available at: support.netbiter.net



9. Installation on an Ethernet Network

The Netbiter EasyConnect Gateway requires outbound (outgoing) access to the Internet, to be able to connect to the Netbiter Argos service. When connected on an Ethernet network, it will use the TCP ports listed below.

Ports for Connection to Netbiter Argos

The Netbiter EasyConnect EC350 will attempt to contact the Netbiter Argos server via port 443.

All other Netbiter EasyConnect Gateways will attempt to contact the Netbiter Argos server via the following outbound ports:

- 5222
- 443
- 80

The above ports are tried in the order shown, and connection attempts will be made to 3 dfferent servers, with a timeout of 30 seconds for each. This means that it may take up to 4 min 30 sec to establish a connection (3 ports x 3 servers x 30s).

Other Connection Ports used:

- 502 - Default port if Modbus TCP is used for internal registers
- 502 - Communication with Modbus TCP slave devices.
- 8080 - Extra web server

Important! - To protect against unauthorized access, the use of a network firewall is strongly recommended. See below.

Note that Netbiter EasyConnect EC220 cannot be installed on an Ethernet network.

Firewall

A firewall is used to control inbound and outbound traffic, thus protecting a network from unauthorized access. TCPI/IP traffic is targeted at a specific port at the destination IP address, a fact used by a firewall to allow or block specific kinds of traffic to specific IP addresses. A firewall normally blocks most incoming traffic, thus preventing access to the site from the internet, but in some cases the firewall may also be configured to block outbound traffic.

Netbiter products use the outbound ports listed above to access the servers at Netbiter Argos. At least one of these ports must be open for outgoing communication to the internet for the Netbiter EasyConnect product to be able to communicate with Netbiter Argos. Outbound ports are configured by the firewall's administrator. Please contact your IT administrator if you are uncertain whether outbound Internet access is allowed on these ports.

9.1 Network Setup - Dynamic IP Address

When the Netbiter EasyConnect Gateway is using DHCP (the default setting), there is no need to configure any of the IP address related settings. The only changes that may be required are the settings needed to pass a proxy server on the network, see below.

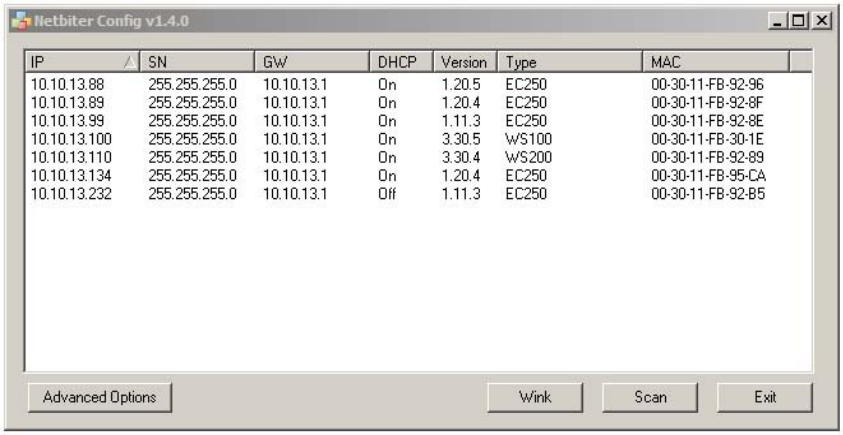
9.2 Network Setup - Proxy Server

For information on how to configure the Netbiter EasyConnect Gateway to pass a proxy server, please see page 52 in the chapter on Local Configuration.

9.3 Network Setup - Fixed IP Address

Setting a fixed IP address for the Netbiter EasyConnect Gateway can be done with the help of the Nebiter Config utility, which is available from support.netbiter.com.

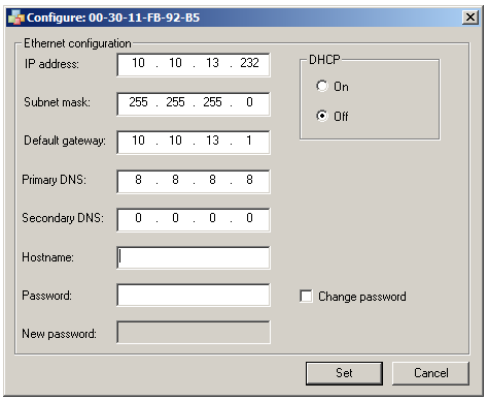
Start the utility and double-click on the required unit, as in the example below.



This will open the dialog for setting the IP address and the related settings, as shown here.

Set the IP address and make the other required settings. You may need to contact the network administrator for this information.

When finished, click the **Set** button.



10. Local Configuration

Netbiter EasyConnect Gateway models also contain a built-in web server that can be accessed locally, to troubleshoot during unit setup, and to set certain parameters regarding the initial communication with the server.

Important! - This type of configuration is **not normally required** and should only be performed if/when necessary.

Note that Netbiter EasyConnect EC220 does not provide these local configuration pages.

Netbiter Argos is the preferred way of making the settings in a Netbiter EasyConnect Gateway and should always be used whenever possible. When there is a choice between making settings locally and making them via Netbiter Argos, they should always be set via Netbiter Argos, as there will be better control of the settings, thus simplifying matters if e.g. a faulty unit needs to be replaced.

The only settings that should be made from the local web pages are:

- **Set mode** (if using any mode other than **GPRS only**) (Netbiter EasyConnect EC250/350 only)
- **Proxy** settings - if the gateway is connected to a network that uses a proxy server
- **PIN code** settings - if using a PIN code for the SIM card, enter it here. Otherwise, this should not be enabled. (Netbiter EasyConnect EC250 only.)

Note that the use of a proxy server and a PIN code for the SIM card will increase the complexity of the setup, as these settings must be made manually and entered locally. For example, when replacing a faulty unit and neither a proxy server or a PIN code is being used, all that needs to be done is to move the SIM card to the new unit and power it up. All the required settings and configuration will be sent from Netbiter Argos, and the new unit will come online automatically.

10.1 Making the Local Connection

Depending on the Netbiter model, access the unit's local web pages can be via one or more of the following:

10.1.1 Ethernet Cable

To access the local web pages in a Netbiter EasyConnect Gateway that supports this function, the PC used for the configuration must be on the same local Ethernet network as the Netbiter. If there is no local network available, an Ethernet cable can be used to connect directly from the PC to the gateway. This may also require the IP address for the PC to be changed manually, to enable access to the gateway.

It is will be necessary to know the IP address of the unit to be accessed. There are several options for discovering the IP address:

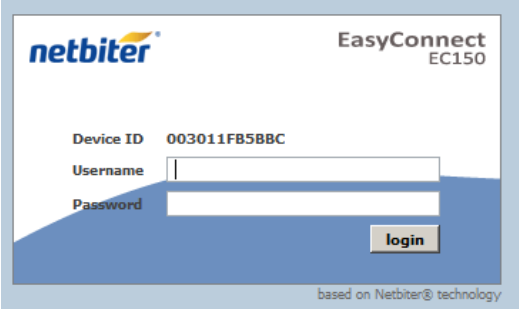
- Download and use the free utility **Netbiter Config**, which scans the local network for Netbiter gateways and displays their IP addresses. Netbiter Config can be downloaded from: http://support.netbiter.com
- Log in to the DHCP server on the local network and find the IP address for the Netbiter in the server's admin pages. Contact the network administrator if required.

10.1.2 USB Cable

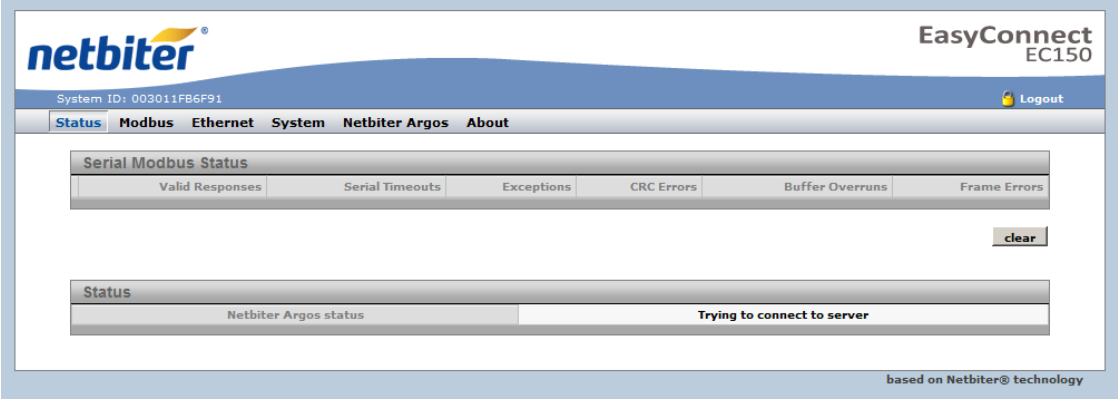
Where supported, this connection can be used to connect the Netbiter EasyConnect Gateway directly to a PC via a USB cable.

10.2 Log in to Netbiter EasyConnect EC150

Type in the IP address as the URL in a web browser will display the login screen. The default user name is *admin*, and the password is the activation code supplied with your unit - see section 8.2.1 *Create the Netbiter Argos account.*



When logged in to the unit, an overview page similar to the following is displayed.

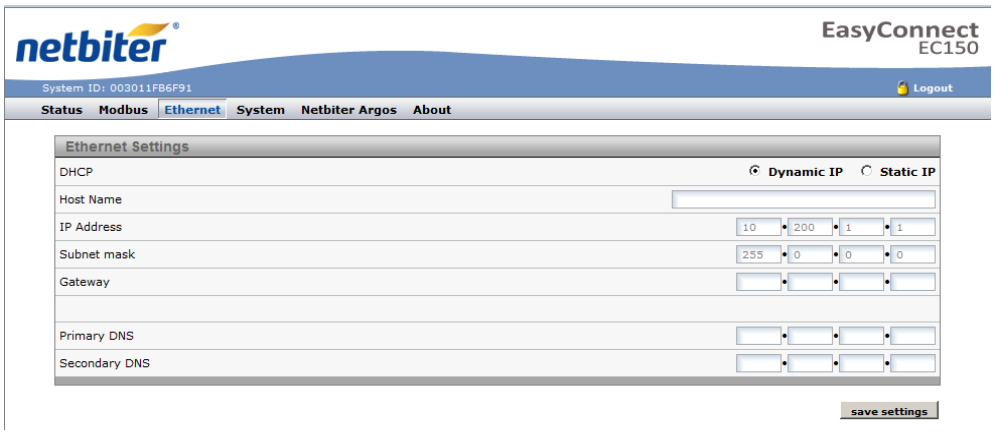


Note that the only changes that should be made in these local pages (and then only if required) are the settings for the network connection, and/or an update to the firmware. All other settings are provided for troubleshooting and informational purposes only. Changes made to these other settings will **NOT** be synchronized with the unit settings existing on Netbiter Argos.

10.2.1 Ethernet Settings

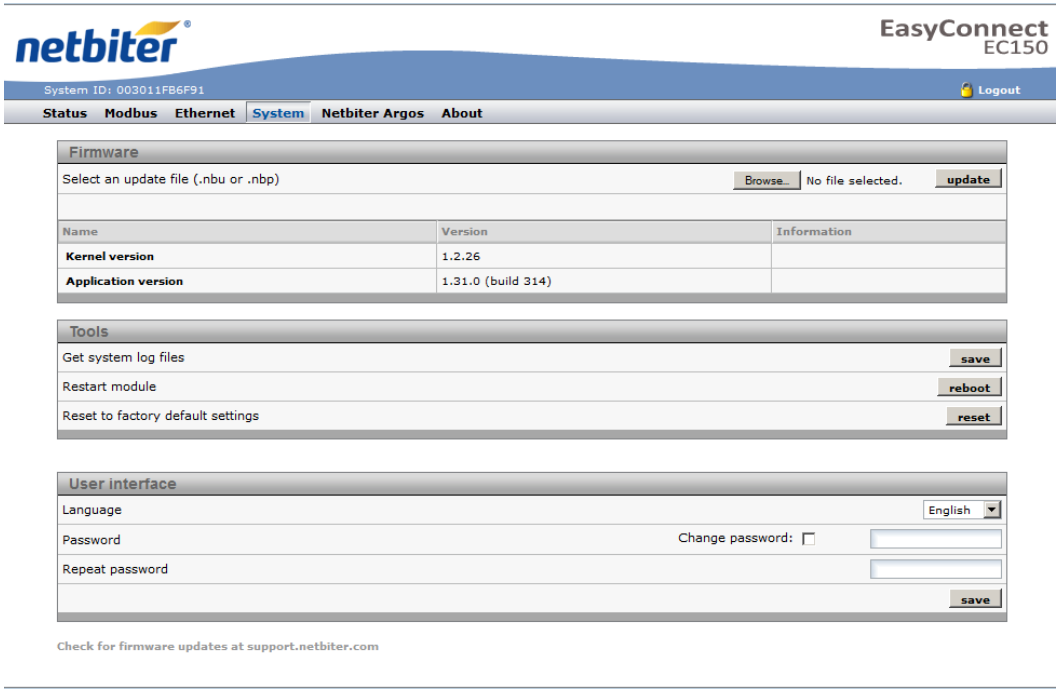
These settings are for the wired Ethernet connection from the Netbiter to the local network and Netbiter Argos.

When DHCP addressing is enbled the unit will automatically receive the settings for IP address, subnet mask and Gateway. If not using DHCP, these settings must be entered manually, along with the settings for DNS servers.



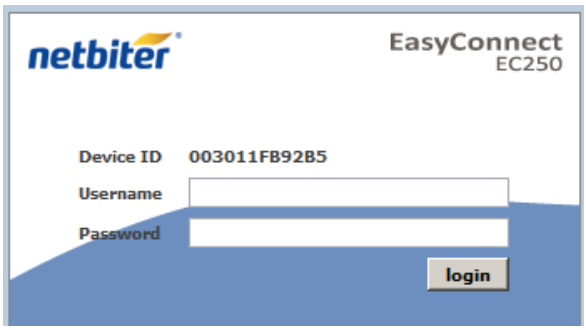
10.2.2 System Settings

Among other things, this page allows the firmware in the unit to be updated. The new firmware file must first be downloaded from support.netbiter.net

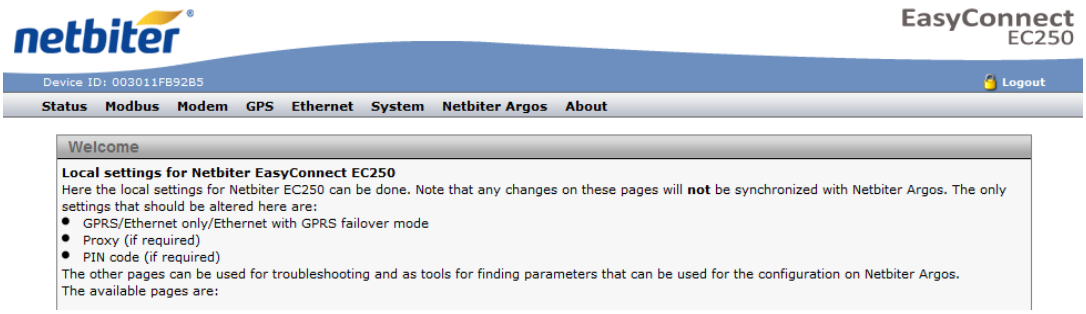


10.3 Log in to Netbiter EasyConnect EC250

Type in the IP address as the URL in a web browser will display the login screen. The default user name is *admin*, and the password is the activation code supplied with your unit - see section 8.2.1 *Create the Netbiter Argos account*.



When logged in to the unit, an overview page similar to the following is displayed.



Note again that the only changes that should be made in these local pages (and only if required) are the settings for the network connection and the PIN code. All other settings are provided for troubleshooting and informational purposes only. Changes made to these other settings will **NOT** be synchronized with the unit settings existing on Netbiter Argos.

10.3.1 GPRS Wireless Connection

Using the wireless GPRS/3G connection requires a SIM card. Using a Netbiter SIM card (from HMS Industrial Networks) is the easiest option. It is also possible to to use a SIM card from another network operator.

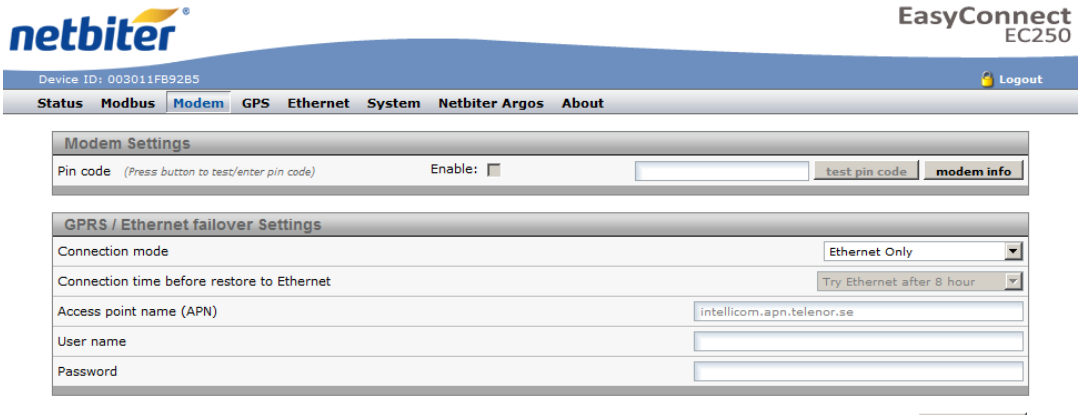
For greater ease of use, it is recommended that a PIN code for the SIM card is not used. A Netbiter SIM card has the PIN code disabled by default. To enable the use of a PIN code, see section 10.3.3.

10.3.2 Insert the SIM Card and Access the Modem Settings

1. With the unit power turned off, insert the SIM card in the holder, and replace it (see page 21 for an illustration).

2. Re-apply power and check the LED indications for a good GPRS/3G signal (see page 28).

3. When logged in locally, click the link to **Modem**. This will display the page for the GPRS and failover settings.



10.3.3 Modem Settings: PIN Code

For greater ease of use, HMS recommends not using a PIN code for the SIM card. However, if using a PIN code is still required, this can be done by checking the box for **Enable**, and entering the SIM card's PIN code, as provided by the card supplier. The PIN code can be tested by clicking the button **Test PIN code**.

Important! - The PIN code on the SIM card **cannot** be activated, deactivated or changed in a Netbiter gateway. Instead this must be done by inserting the SIM card into a mobile phone and performing these operations from there.

Note that any changes made to the PIN code function in a mobile phone must also be repeated in the modem settings described above, i.e. if the PIN code is enabled and/or changed in a mobile phone, then the **Enable** box must be checked ant the new code entered in the field provided in these settings in the Netbiter EasyConnect EC250/350.

10.3.4 GPRS/Ethernet Failover Settings

Connection Mode

Netbiter EasyConnect EC250 can be used in three different modes:

- GPRS only (default setting)
- Ethernet failover to GPRS
- Ethernet only

When the Netbiter is set to **Ethernet failover to GPRS**, if the Ethernet connection to Internet is lost, the unit will automatically switch to GPRS communication, and the exchange of data with Netbiter Argos will continue.

Connection Time Before Restore to Ethernet

After using Ethernet (1) and the connection is lost, Ethernet will failover to GPRS. After a specified time in GPRS mode (2), the unit will attempt to use Ethernet again (3). If the Ethernet connection has been restored, it will be used again, otherwise GPRS will continue to be used and the cycle will be repeated until the Ethernet connection is working again.

Access Point Name (APN)

This is the identifying name used to connect to a mobile network. The network operator for the SIM card can supply this information.

User name / Password

If the connection to the mobile network requires a user name and password, enter these here.

After making these settings, click **Save settings**.

10.3.5 Proxy Servers

Communication through a proxy server can be set up locally, via the built-in web server in the Netbiter EasyConnect Gateway.

Ethernet Port to Use

First ensure that the proxy server is set up to use at least one of the following ports:

- Port 443
- Port 80
- Port 5222

If not, the Netbiter EasyConnect Gateway will automatically try to use a port that is open to the Internet. The ports listed above must be used to communicate with Netbiter Argos. A port on the LAN side might have another port defined for the proxy, but still needs to use one of the above ports on the WAN side (port forwarding).

Proxy Types

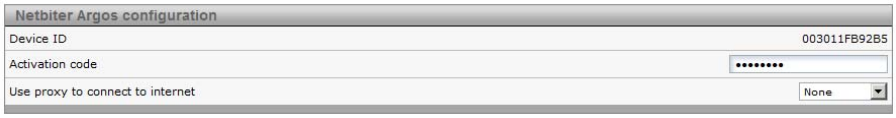
The type of proxies that can be used are:

- HTTP
- Socks 4(a)
- Socks 5

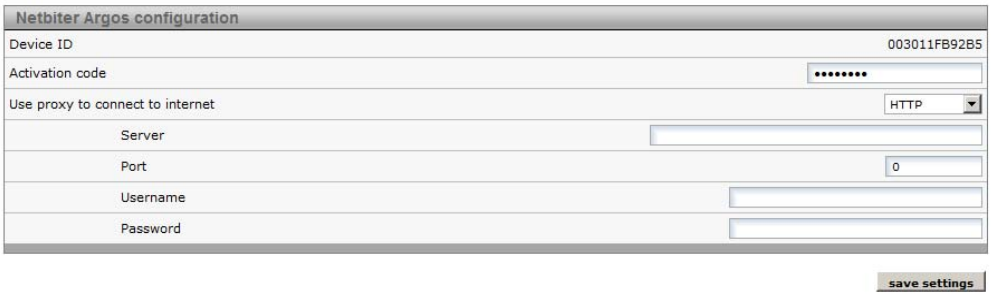
Obtain access to any credentials required by the proxy server. This information should be provided by the network administrator.

10.3.6 Local Proxy Setup

1. Log in locally to the Netbiter EasyConnect Gateway as described above.
2. Click **Netbiter Argos** in the menu.
3. Select the proxy type to use.



4. Enter the proxy server address.
5. Enter the port to use on the LAN side. If blank, this will be set to port 443.



6. Enter the user name and password, if required for the proxy server.
7. Click **Save settings**.

10.4 Log in to Netbiter EasyConnect EC350

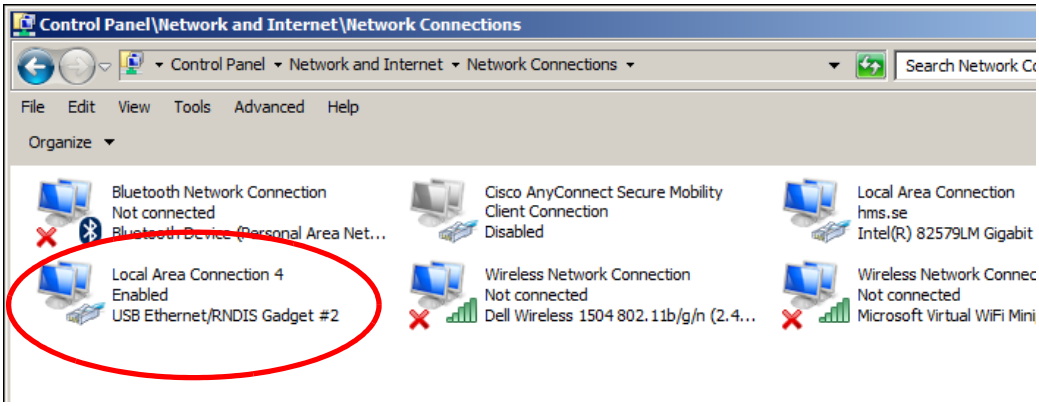
10.4.1 Select Login Method

The Netbiter EasyConnect EC350 supports local access via the Ethernet connector and the USB connector.

USB

Connect a USB Micro B cable between the computer and the Netbiter EasyConnect EC350. After the device driver is installed, a virtual network card will automatically be created on, as in the example below.

It will then be possible to log in to the unit via a web browser, at the IP address **169.254.200.200**, see below. Note that this IP address applies only to the USB connection.

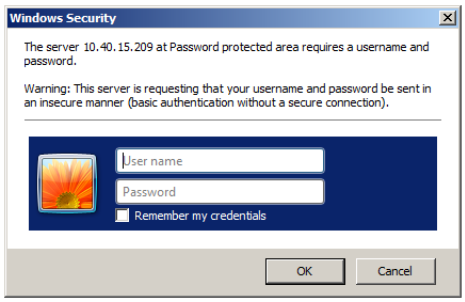


Ethernet Connection

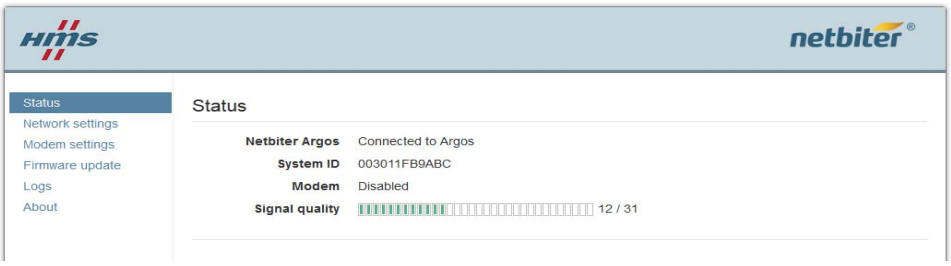
Connect an Ethernet cable to the **WAN** socket on the Netbiter EasyConnect EC350, and then log in to the unit via a web browser. If the IP address is not known, it will first be necessary to obtain this information. See section 10.1.1 on page page 47 for details on how to do this.

10.4.2 Login

Typing in the IP address as the URL in a web browser will display the login screen. The default user name is *admin*, and the password is the activation code supplied with the unit - see section 8.2.1.



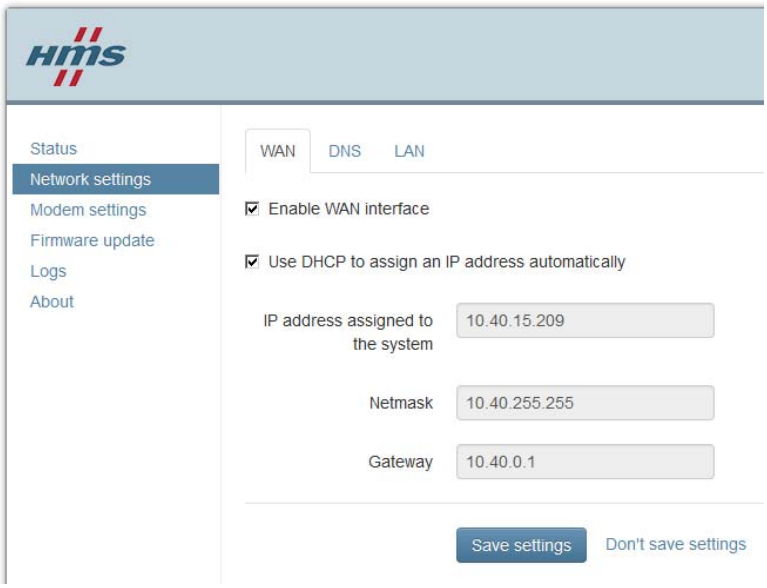
When logged in to the unit, a status page similar to the following is displayed.



The changes that can be made in these local pages (and then only if required) are for the network and modem settings. The product firmware can also be updated here, which requires an active connection to the Internet. Changes made to these other settings will **NOT** be synchronized with the unit settings existing on Netbiter Argos. Various logs are also supplied for troubleshooting purposes.

10.4.3 Network Settings

These settings apply to connections made via the RJ-45 WAN and LAN ports on the bottom of the unit.



WAN

This interface is the one to enable and use if the Netbiter EasyConnect EC350 will connect to Netbiter Argos via a wired Ethernet connection.

When DHCP addressing is enbled the unit will automatically receive the settings for IP address, Netmask and Gateway. If not using DHCP, these settings must be entered manually, along with the settings for DNS servers - see the middle tab for these settings.

DNS

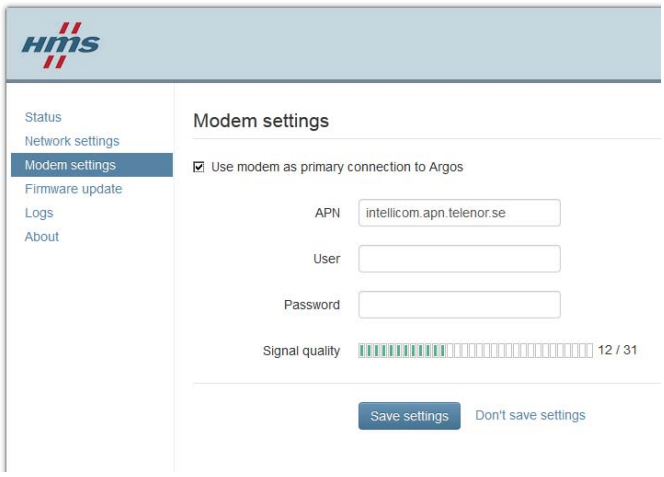
When using a static IP address (i.e. when not using DHCP), specify a primary DNS server here. A secondary DNS may also be specified if desired.

LAN

The LAN interface is disabled by default, and is intended for use with future features.

10.4.4 Modem Settings

The built-in modem in the Netbiter EasyConnect EC350 communicates via 2G/3G cellular networks, which requires a SIM card. Using a SIM card from HMS Industrial Networks is the easiest option, but it is also possible to to use one from another network operator.



Important! - There is no support in the Netbiter EasyConnect EC350 for using a PIN code on the SIM card. For a SIM card with an active PIN code, the code must first be deactivated by inserting the card into a mobile phone and performing the operation there. The PIN code **cannot** be deactivated in the Netbiter EasyConnect EC350.

Use Modem as Primary Connection to Argos

Checking this box will cause the modem to always be used for communication as long as there is a good 2G/3G signal available. If the WAN interface is also enabled, this will automatically be used if the 2G/3G connection is not available.

APN (Access Point Name)

This is the identifying name used to connect to a mobile network. The network operator for the SIM card can supply this information.

User name / Password

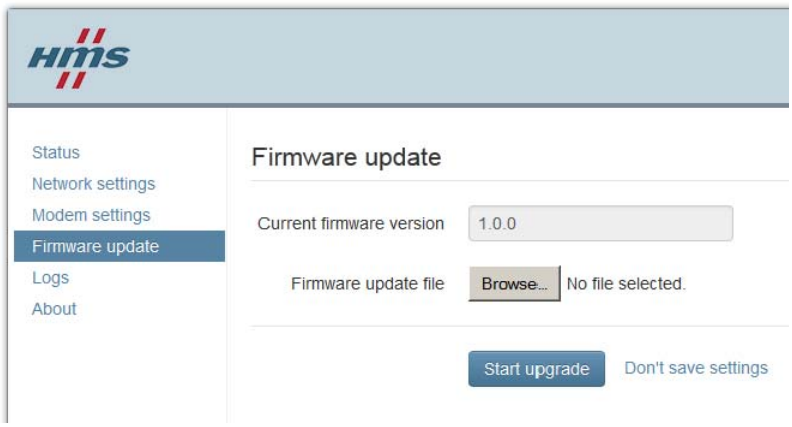
If the connection to the mobile network requires a user name and password, enter these here.

After making these settings, click **Save settings**.

10.4.5 Firmware Update

This page can be used to update the Netbiter EasyConnect EC350 with new firmware.

The file containing the new firmware must first be downloaded from support.netbiter.com



11. Firmware Upgrade

Alternative Methods

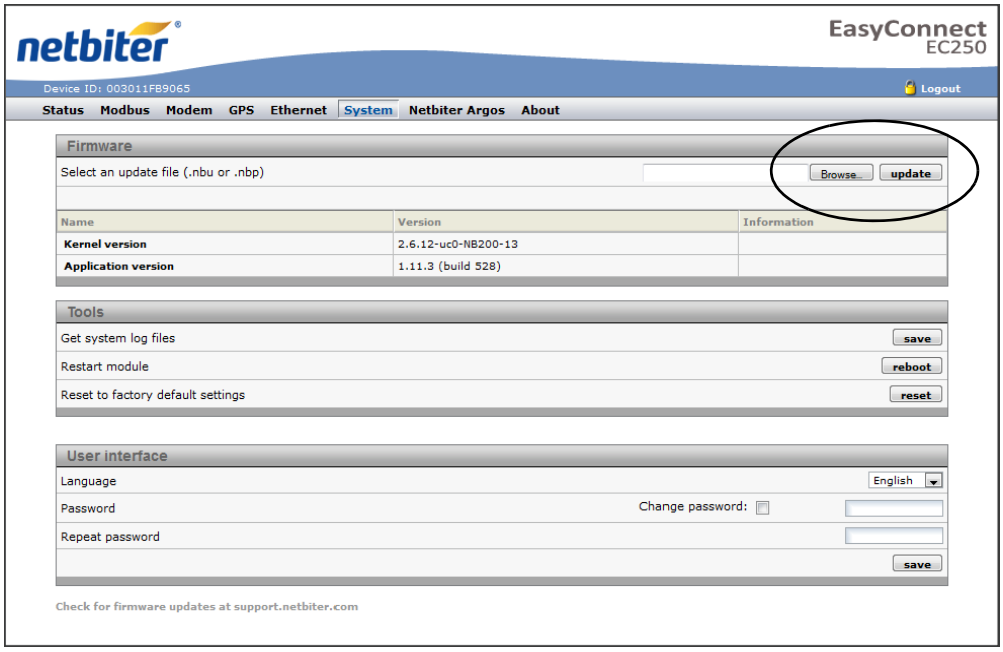
- The easiest way to perform a firmware upgrade is from the Netbiter Argos web pages. Please see the *Netbiter Argos User Manual* for instructions on how to do this.
- If an upgrade is not possible via Netbiter Argos - for those models that provide access to the advanced local configuration web pages, there is also the option to perform the upgrade from here. See section 11.1.
- If an upgrade is not possible via the Netbiter Argos or via the advanced local configuration web pages, it is also possible to upgrade the firmware via a connection to a local PC, using the free tool Netbiter Update. See section 11.2.

11.1 Upgrade via the Local Configuration Pages

This process is available for the models that support local configuration pages, i.e. all models with the exception of Netbiter EasyConnect EC220.

To upgrade the firmware locally, the new firmware file is required. Please contact your local support office to obtain the file.

1. When logged into the unit's local web pages, click on **System>>Firmware.** This opens the webpage as shown in this example from Netbiter EasyConnect EC250. This location may be different in other models.



2. In the upper right of the window, click the **Browse** button to locate the correct firmware file.

3. Click the **Update** button, to start the upgrade process.

11.2 Upgrade Using Netbiter Update

If, for some reason, the Netbiter EasyConnect Gateway cannot be upgraded via Netbiter Argos or via the local configuration pages, the process will need to be performed locally, using a direct cable connection. This is possible to do on Netbiter EasyConnect EC150 and Netbiter EasyConnect EC250.

Please contact your nearest support office to obtain the required firmware file, and then follow the instructions provided here.

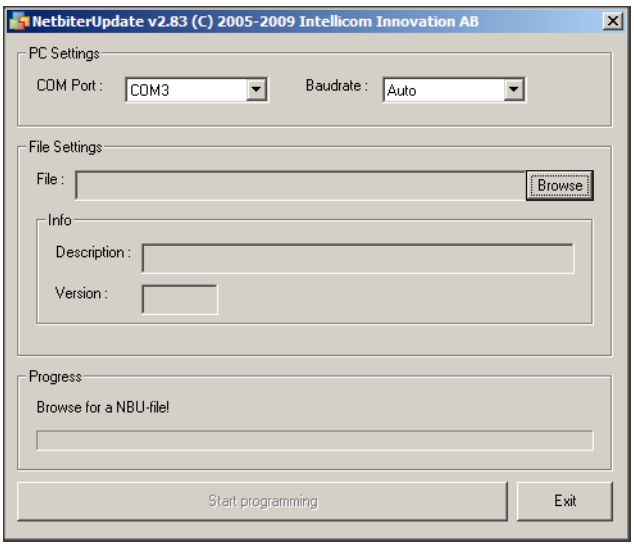
Requirements

- The firmware file for your Netbiter EasyConnect Gateway model.
- Physical access to the unit to be upgraded/reprogrammed.
- A PC with a free COM port.
- A Null-modem cable.

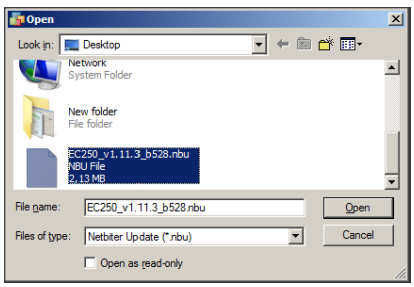
1. Download the tool **Netbiter Update** from support.netbiter.com. Save the file to your PC.

2. Using the null-modem cable, connect the Netbiter EasyConnect Gateway to a COM port on your PC. The cable should be connected to the 9-pin D-Sub connector.

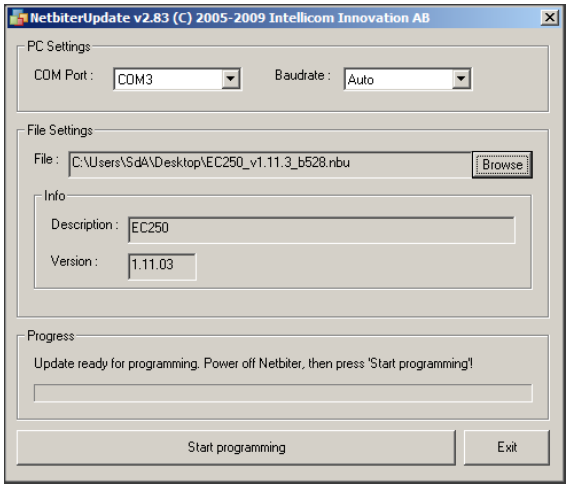
3. Start Netbiter Update. You should see a **COM port** already selected. Leave the **Baudrate** setting at *Auto*.



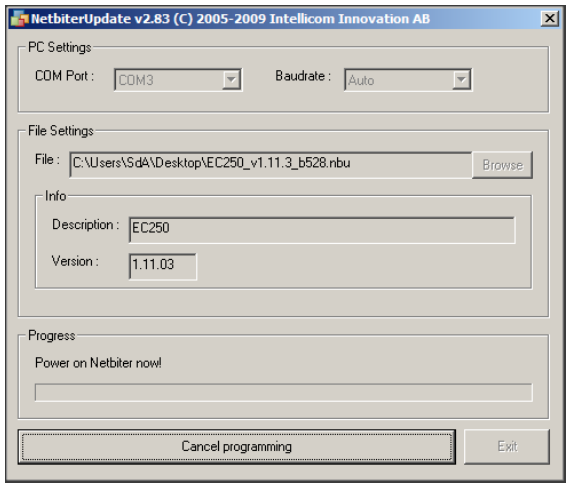
4. Click the **Browse** button to locate the (NBU) firmware file you received from the support office. Click the **Open** button to select the file.



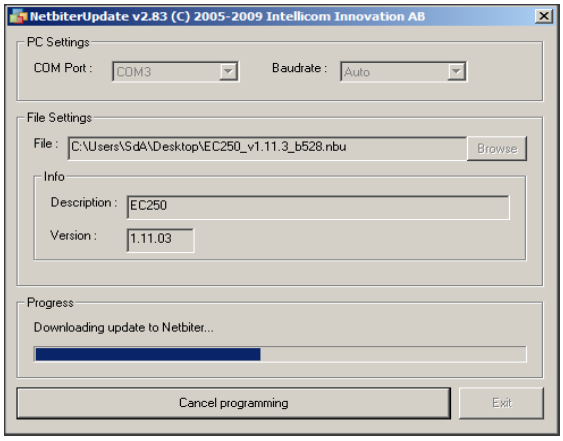
5. Power **OFF** the Netbiter EasyConnect Gateway, as instructed by the dialog, and then click the button **Start Programming**.



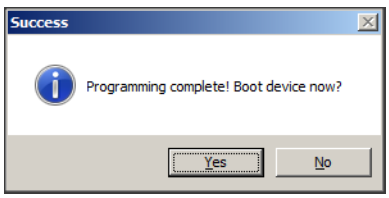
6. Now power **ON** the Netbiter Easy-Connect Gateway again.



7. Wait while the tool reprogrammes the unit. The update progress is indicated by the blue bar.



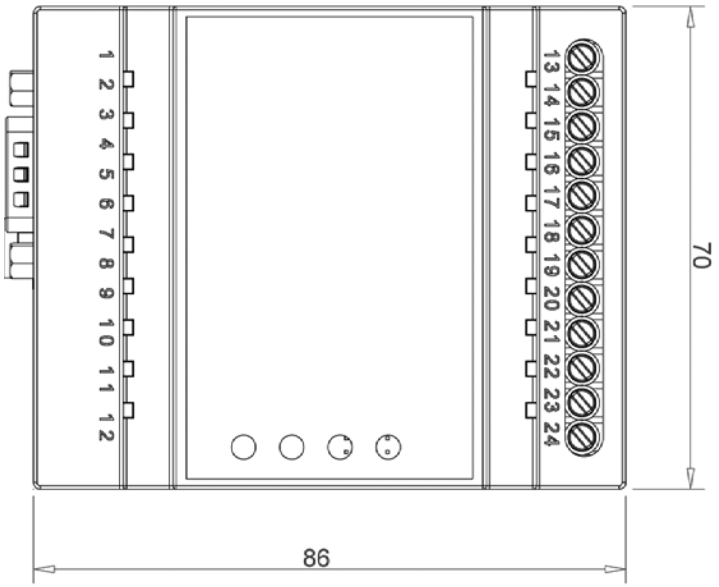
8. When the update is complete, you will be asked if you wish to reboot the unit. Click **Yes** to complete the process.

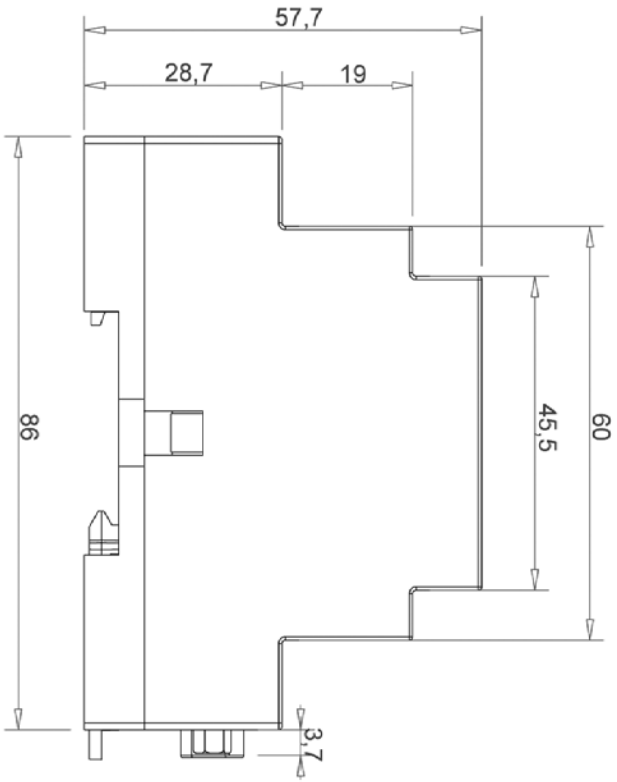


12. Dimensions & Specifications

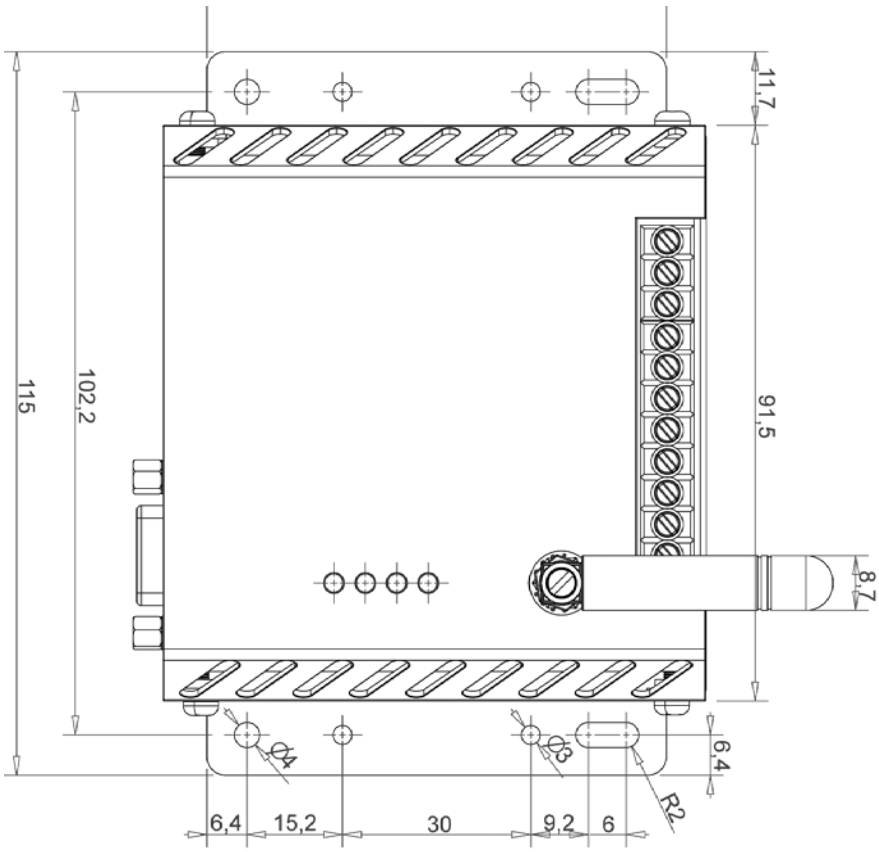
All measurements are shown in millimetres.

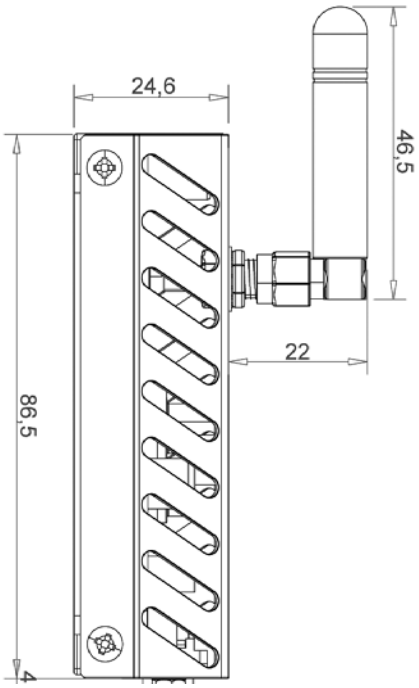
12.1 Dimensions Netbiter EasyConnect EC150



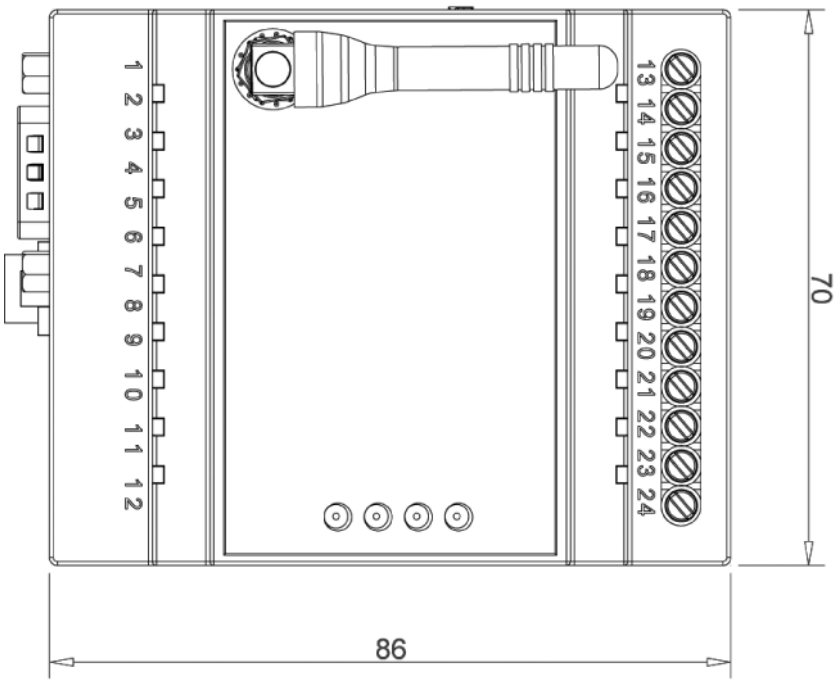


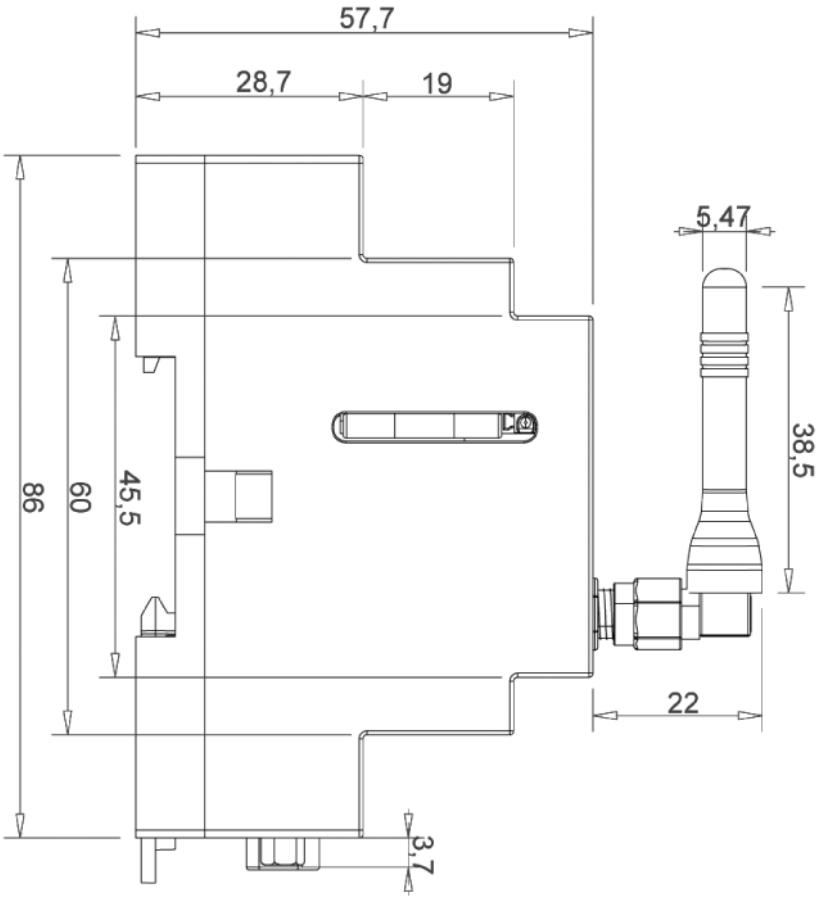
12.2 Dimensions Netbiter EasyConnect EC220



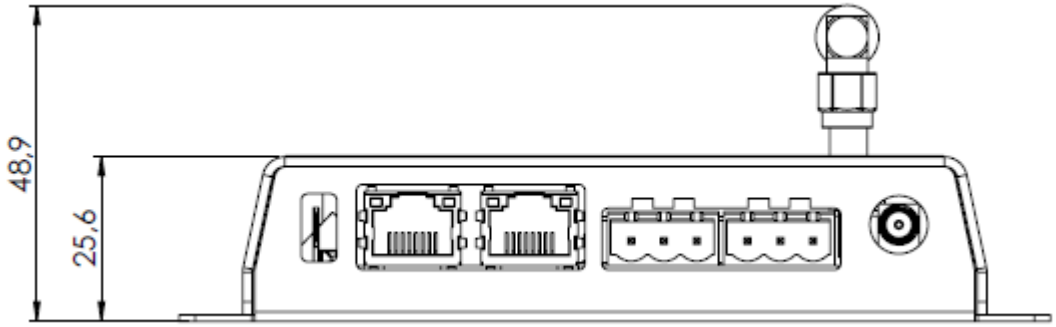


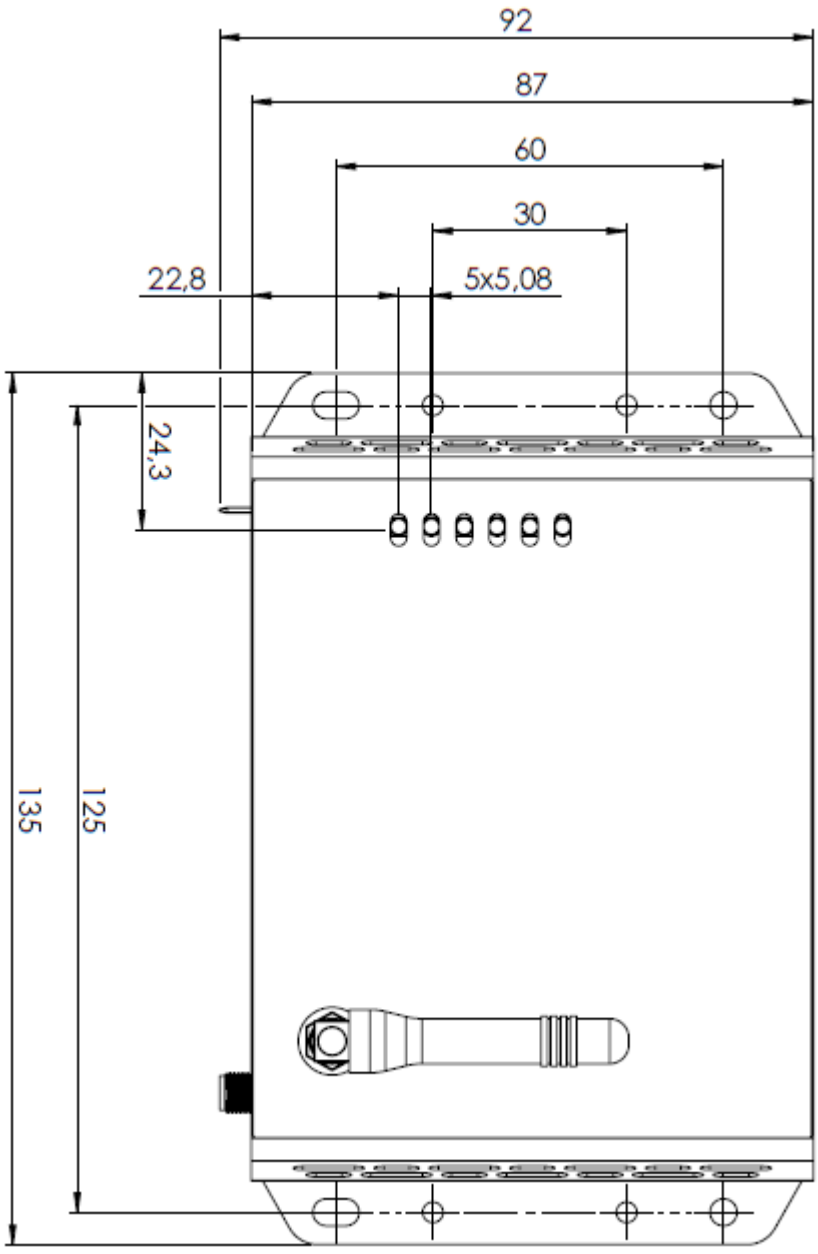
12.3 Dimensions Netbiter EasyConnect EC250





12.4 Dimensions Netbiter EasyConnect EC350





12.5 Specifications EC150 & EC220

	Netbiter EasyConnect EC150	Netbiter EasyConnect EC220
Order code	NB1001	NB1000
Ethernet	10/100 Mbit/s	-
GPRS	-	Quad band GPRS Class 12 850/900/1800/1900 MHz
Alarms	Email, SMS	Email, SMS
Relay output (max 24V AC/DC, 1A)	1	1
Digital inputs (isolated max 24V DC)	2	2
Analog inputs	-	2 (PT100, 0-10V or 0-20mA) Resolution: 11.25 bit (raw value 0-2400)
Analog output (0-10V)	-	1
Serial port #1	RS-232 up to 115,2 kbit/s	RS-232 up to 115,2 kbit/s
Serial port #2	RS-232/RS-485 up to 115,2 kbit/s (isolated)	RS-485 up to 115,2 kbit/s (isolated)
Antenna connector	-	SMA female
Protocols	Modbus-RTU, ASCII, TCP/IP	Modbus-RTU
Modbus slaves	32	16
Baud rates	300-115200 baud	300-115200 baud
Wall mounting	No	Yes
DIN rail mounting	Yes	Yes (optional)
Dimensions (WxDxH)	90 x 70 x 58 mm	92 x 115 x 25 mm
Operating temperature	-40 to +65° C	-30 to +65° C
Storage temperature	-40 to +85° C	-40 to +85° C
Housing class	IP20	IP20
Power supply	9-24 V DC or AC	9-24 V DC
Power consumption	2 W	2 W
Certifications	CE, ROHS	CE, cULus, FCC/IC, PTCRB

12.6 Specifications EC250 & EC350

	Netbiter EasyConnect EC250	Netbiter EasyConnect EC350
Order codes	NB1003	NB1005
Ethernet	10/100 Mbit/s	10/100 Mbit/s
Mobile communication	Quad band GPRS Class 12 850/900/1800/1900 MHz	3G: 5-Band UMTS/HSPA+ (WCDMA/FDD) (850/800, 900, 1900 and 2100 MHz) GPRS: Quad-Band GPRS Class 12 (850/900/1800/1900 MHz)
Alarms	Email, SMS	Email, SMS
Relay output (max 24V AC/DC, 1A)	-	1
Digital inputs	2, isolated max 24V DC	2, type dry contact
Analog inputs	-	4 inputs, all supporting 0-10V or 0-20mA. Support for PT100 on AI1 and AI3. 11-bit resolution. Raw value 0-2400.
Serial port #1	RS-232 up to 115.2 kbit/s	RS-232 up to 115.2 kbit/s
Serial port #2	RS-485 up to 115.2 kbit/s	RS-485 up to 115.2 kbit/s
Antenna connector	SMA female	SMA female
Protocols	Modbus-RTU, ASCII, TCP	Modbus-RTU
Modbus slaves	32	32
Baud rates	300-115200 baud	1200-115200 baud
Wall mounting	No	Yes
DIN rail mounting	Yes	Yes (optional)
Dimensions (WxDxH)	90 x 70 x 58 mm	135 x 92 x 26 mm
Operating temperature	-30 to +65° C	-40 to +65° C
Storage temperature	-40 to +85° C	-45 to +85° C
Housing class	IP20	IP20
Power supply	9-24 VDC	12-48 VDC
Power consumption	3 W	4.5 W
Certifications	CE cULus FCC/IC (Pending) PTCRB (Pending) RoHS	CE RoHS Telec (Pending) RCM (Pending) cULus (Pending) FCC (Pending) IC (Pending) PTCRB (Pending) ATEX/Haz Loc (Pending)

13. FAQ & Troubleshooting

13.1 Frequently Asked Questions

Q: What Can I Do if I Have Lost my Activation Code?

Please contact your local support channel and send us the MAC address for your Netbiter Gateway. We will provide you with the activation code.

Q: How Many Characters Can an SMS Message Contain?

An SMS text message can contain 70 characters. The standard SMS length is 160 characters, but because of the included language support (e.g. Cyrillic), this is limited to 70 characters.

Q: Which GPS Receiver Should I Connect to Netbiter EasyConnect EC220 or Netbiter EasyConnect EC250?

The GPS unit should support the NMEA protocol version 3, as well as GGA and RMC messages. It should communicate on an RS-232 interface at baud rates 1200-115200 bps.

Q: How Many Modbus Devices can be Connected to a Netbiter Gateway?

For Netbiter EasyConnect EC220, 16 devices can be connected. For all other EasyConnect models, 32 devices can be connected.

Q: How Many Parameters Can be Logged and Used for Alarms in a Netbiter Gateway?

Netbiter EasyConnect EC220 supports 16 log parameters and 16 alarm parameters.

Netbiter EasyConnect EC150 and Netbiter EasyConnect EC250 support 64 log parameters and 64 alarms.

Netbiter EasyConnect EC350 supports 128 log parameters and 128 alarms.

Q: How Much Data Traffic is Generated?

This is dependent on how many pages you view and if these pages have images. A short estimate using a list of common operations is provided here:

Operations:

- Login
- open page with image
- refresh values 5 times
- open log page
- download log file (600x3 values, 23kB)

These operations will generate approximately 450kB data traffic. Using a subscription that includes 1GB data, this could be done 2000 times per month.

Q: How Can I Keep Track of the Amounts of Data, in Order to Save Costs?

There are built-in registers that can be set up to generate alarms when traffic exceeds a specified limit. For example, if the total bytes sent and received during the last 24 hours is more than 10,000,000 bytes, you could use this to trigger an alarm.

Q: The Netbiter.net Server is Based in Sweden - is the Modem Making a Direct Connection to Sweden?

No. The GPRS/3G connection is an Internet connection, so - depending on your subscription - you will get a local connection to your local service provider. After that connection is made, it does not matter to which country the data is transferred.

Q: What is the Cost When Using "always connected" for GPRS?

This depends on the amount of data being sent and received. When connected to Netbiter.net, the Netbiter Gateway will generate traffic to indicate that it is "alive" - this is limited to a few bytes, a couple of times per hour. When using "always connected" there are settings for "Host to ping" and "Ping timer" - if active these will also generate small amounts of traffic to keep the connection alive.

Q: What if Someone Starts Pinging my Fixed IP Address?

This will also generate data, the amount will depend on the type of attack.

Q: What Type of GPRS Subscription Should I Use - DHCP or Fixed IP Address?

For normal usage (logging and alarms) and viewing data on Netbiter.net, there is no need for a fixed IP address.

If you need to connect directly to the Netbiter Gateway, to control and change values or settings, then a SIM-card with a fixed IP address must be used.

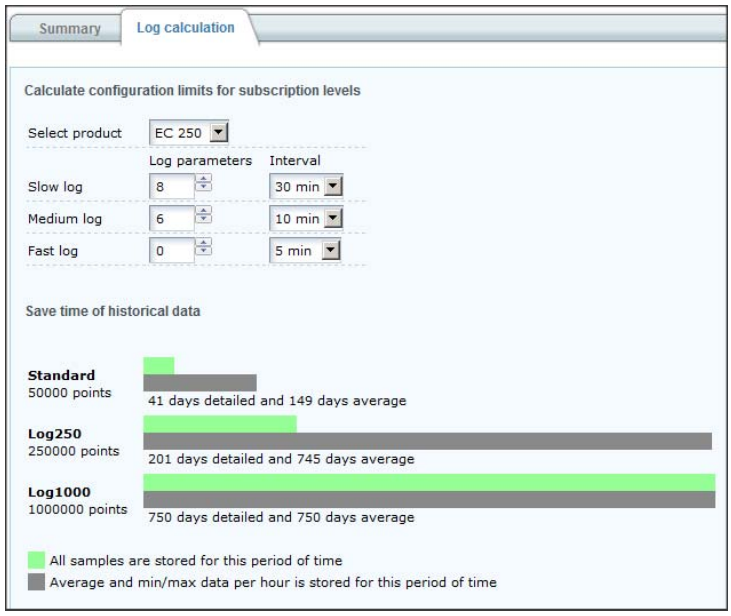
Additional functions are being planned for Netbiter.net, so the need for a fixed IP address should be minimized, and hopefully eliminated in the near future.

Q: How Can I Calculate the Length of Time Log Data is Saved?

Log size depends on the following parameters:

- the number of parameters being logged
- the format and number of digits (decimals, commas, etc.) for each parameter
- the sample time

For a log parameter with five digits and a separating comma, this will give 6 bytes per log parameter. Each line also contains the date and time, which uses an additional 16 bytes per line.



To calculate the time that logs are saved for, please use the tool provided in Netbiter Argos, see **Account>>Log Calculation**. In this tool you simply enter the product, as well as the number of parameters to be logged and their sample intervals. The save time for the logs is then shown for 3 different subscription levels.

Q: How Do I Add a Log Parameter/alarm Parameter/alarm Recipient?

Please see the step-by-step guide in Netbiter Argos.

Q: How Do I Connect My Modbus Device and Address it?

You need to use/create a template for the device and then add it as a device in the configuration. Please contact support for help with building a template or checking if there is a ready-made template available.

Q: What is a Device Template?

A device template can be described as a file describing the Modbus parameters for a connected device, or as a translation table for the data addresses in the device. It contains information about the available Modbus addresses and their data types, with predefined scaling and offset.

Q: What is a Device Profile?

A device profile contains a device template, but also further configuration designed to provide a complete interface for the user, including e.g. dashboards, visualisations, and various other gateway settings.

Q: We Have a Large installation with Many Identical Device Setups. What Should We Do?

1. Create a Profile for the device template(s) included in the installation. See the User Manual for Netbiter Argos.
2. Create a Profile dashboard for the template(s).
3. Connect the profile to the devices to be installed.

13.2 Troubleshooting

Problem: The Netbiter EasyConnect Gateway Does not Come Online

- **GPRS**: In Netbiter Argos, check the APN settings and signal strength. Ensure that the PIN code for the SIM card is disabled.
- For **Ethernet**: Make sure that one of the Ethernet ports 443, 80 or 5222 is open in the firewall, and if a proxy is used, check that the settings for it are correct.

To test the connection, download and use the **Netbiter Connection Test tool** at support.netbiter.com. This tool is for Windows XP/Vista/7 and it should be run on the same network as the Netbiter EasyConnect Gateway. It will report any problems found in the connection to the Netbiter.net server (e.g. traffic blocked in firewall etc).

Problem: The Presentation Page Does not Show any Values

This is probably due to incorrect Modbus settings. In the local configuration pages, go to **Setup >> Modbus** and check the settings.

Problem: My Netbiter EasyConnect Gateway Does not Show up in Netbiter Config

Netbiter Config can be used to discover a Netbiter EasyConnect Gateway on the local network. Note, however, that only the network on the primary network interface (NIC) will be scanned.

By default, the Netbiter EasyConnect Gateway is configured to use a DHCP server, which assigns the unit an IP address. If the module is connected to a network with no DHCP server, the unit will not get an IP address, and will not appear in Netbiter Config.

To set a static IP address (on models with an Ethernet connection), the Netbiter EasyConnect Gateway can be connected directly to a computer, using a standard Ethernet cable. In Netbiter Config, click the **Advanced Option**s button at the bottom left corner of the program window. A DHCP server can now be started from Netbiter Config. Check the box for *Enable internal DHCP server*.

Make sure that the computer is directly connected to the Netbiter EasyConnect Gateway. The unit will be given a temporary IP address and will appear in the Netbiter Config list. Double-click on the unit and set a static IP address, gateway and DNS server. To disable the internal DHCP server, click the **Advanced Options** button.

Problem: Log Files Have Empty Fields (Missing Data)

Some modbus slaves have a minor timing issue that results in their not listening for a short period of time when other slaves have been accessed. Most devices follow the Modbus specification for these timings, but others may require a slightly higher value.

There are two settings available from the local configuration pages that may compensate for this situation. These are found at: **Setup>>Modbus**

- Parameter “Slave Response Timeout” - try increasing this in steps of 250ms. If there is no improvement at 1500 or more, the problem is elsewhere.
- Parameter "Extra delay between messages". Starting at 20, experiment with a few different values, increasing in steps of 20 to see if this resolves the issue. If there is no improvement by 200ms, then the problem is elsewhere.

Problem: Modbus Communication is Not Working over RS-485

This is often due to a problem with the wires. Check that the A and B lines are connected properly. If there is no problem with the wires, try switching places for the A and B lines.